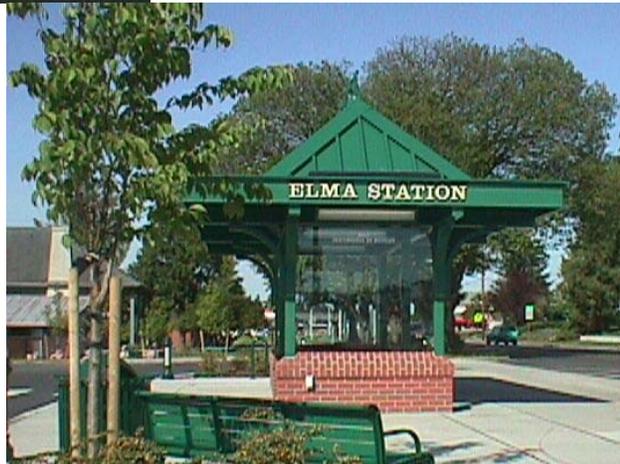


Guide to Preparing Your Transit Asset Management Plan



Vehicles

Facilities



Equipment

Guide to Preparing Your Transit Asset Management Plan

For Washington State Transit Agencies in meeting state asset management requirements

Prepared by the
Washington State Department of Transportation
Public Transportation and Rail Division

In partnership with the
Transit Maintenance Expert Panel



Pictured from left to right: Dave Richards, Jim Boon, Randy Winders, Pete Stark, Bruce McCaw, Carla Meyer, Terry Mills, and Jim Wakeman

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Introduction

This guide describes the components associated with transit asset management. It includes background on the legislative requirement, guidance on how to prepare a transit asset management plan, and a plan template. The planning parameters described in this guide are consistent with Federal Transit Administration (FTA) requirements.

Background on the requirement

This section provides background information on the transit asset management legislative requirement.

What is required?

As a condition of receiving state funds, publicly owned transit systems are required to submit an asset management plan to the Washington State Transportation Commission for certification. The plan must inventory all transportation system assets and provide a preservation plan based on lowest life-cycle cost (LLCC) methodologies.

Where did the requirement come from?

Senate bill 5248 was passed by the 2003 Washington State Legislature, in response to efficiencies identified by the Blue Ribbon Commission on Transportation. This legislation guides maintenance and preservation of transportation assets in Washington State. The legislature found that transportation assets in the state represent a significant investment of public funds. The legislature intend was to ensure that cost effective maintenance and preservation is provided for public assets.

Who does the requirement apply to?

This requirement applies to Washington State transit systems established under the following sections of the Revised Code of Washington (RCW):

- RCW 35.84.060 – City Transit Systems (defined in RCW 47.04.082)
- RCW 36.56 – County that has assumed the functions of a metropolitan transportation system (King County)
- RCW 36.57A – Public Transportation Benefit Areas (PTBAs)
- RCW 81.112 – Regional Transit Authorities

How were the specific requirements developed?

The Washington State Department of Transportation (WSDOT), Public Transportation and Rail Division (PT&R) was given the responsibility of developing the planning parameters associated with the public transit sections of Senate bill 5248. The following information is an overview of how PT&R and the Washington State Transit Association's Expert Panel developed the specific elements to comply with this new law.

What process was used?

Below is a description of the process PT&R used in developing the planning parameters to meet the legislative intent.

1. PT&R in coordination with the Washington State Transit Association (WSTA) established an Expert Panel
2. Several transit agencies' preventative maintenance programs were reviewed to identify the differences between what WSDOT currently receives and what the legislature requires
3. A draft asset management plan framework was developed
4. The draft framework was presented to the Transportation Commission for input and concurrence
5. Ongoing communication with public transit agencies was provided for input
6. The final draft framework was presented to the Transportation Commission for approval
7. Training and technical assistance will be provided to transit professionals
8. The plans will be collected, reviewed, and submitted to the Transportation Commission for Certification

Who was on the Expert Panel?

The Expert Panel was composed of volunteers from the Washington State Transit Association (WSTA) Maintenance Committee. The Expert Panel included the Chair of the maintenance committee and representatives from each size of transit system (i.e. large urban, small urban, and rural). In addition, because they provide insurance coverage to most of the transit agencies in the state, the Washington State Transit Insurance Pool (WSTIP) was asked to provide a representative. PT&R wanted to ensure

that the plan parameters did not conflict with WSTIP's requirements. Members of the Expert Panel include:

- Large Urban Representatives:
 - Jim Wakeman – C-Tran
 - Dave Richards – Community Transit
 - Jim Boon – King County Metro
- Small Urban Representatives:
 - Randy Winders – Intercity Transit
 - Pete Stark – Whatcom Transit
- Rural Representatives
 - Carla Meyer – Jefferson Transit
 - Bruce McCaw – Valley Transit
 - Terry Mills – Island Transit
- Washington State Transit Insurance Pool - Tracey Christianson

What was the role of the Expert Panel?

The role of the Expert Panel was to provide guidance to WSDOT in:

- Defining LLCC for transit
- Developing the planning framework
- Establishing the certification criteria

How was LLCC defined?

The Expert Panel was provided with information on how the LLCC methodology is applied in other transportation modes and the concepts behind this methodology. The panel found that the concepts behind the LLCC methodology mirrored those behind a responsible preventative maintenance program.

For the purposes of the Transit Asset Management Plan LLCC is defined below:

“Lowest life cycle cost methodology is demonstrated by a cost model that reflects each agency’s policies and standards in a planned preventative/preservation maintenance program resulting in the lowest maintenance costs over the life of an asset. This methodology ensures that an asset is maintained at a acceptable condition maximizing safety and useful life.”

This means that incremental preventative maintenance activities are conducted to preserve the life of the asset. In addition to preserving the assets life, this approach results in lower maintenance costs over the life of the asset. When using LLCC methodology, transit agencies assess the cost of an asset over its projected useful life and take the preventative maintenance measures needed to avoid more costly repairs.

What assets must be included in the inventory?

The legislation states that “the plan must include an inventory of all transportation system assets within the direction and control of the...[county, municipality, authority]...” The requirement does not apply to assets that are owned and operated by contractors. However, it does apply to vanpool vehicles and assets that are owned by the transit agency but operated and maintained by a service contractor.

How are assets defined?

For the purposes of the Asset Management Plan (AMP) and to reduce duplication of effort, WSDOT adopted definitions already established and reported by the transit systems. The Federal Transit Administration requires that each state develop a Public Transportation Management System (PTMS) that includes an inventory of all transit systems assets in the state. All transit systems currently submit this inventory to WSDOT as part of the annual reports associated with their transit development plans (TDPs). For the purposes of the Asset Management Plan, assets are defined as:

- All rolling stock (passenger service vehicles)
- Facilities with a replacement value of \$25,000 or greater
- Other equipment with a replacement value of \$100,000 or greater

How will plans be certified?

In order for a plan to be certified by the Transportation Commission, it will need to be submitted to PT&R for review. PT&R will review each plan to ensure that it includes all of the elements of the framework, and reflects LLCC methodologies. After any issues have been resolved, PT&R staff will present the plan to the Commission with a recommendation for certification. Once the Commission certifies the plans, the transit agencies will be sent a letter stating the date their plan was certified.

When are the plans due?

Transit systems may begin submitting their asset management plans at any time. However, transit agencies are encouraged to submit their plans by April 15th with a final due date of May 15, 2005. This will allow PT&R staff time to review the plans, resolve any issues, and present the plans to the Transportation Commission for certification prior to the beginning of the next state funding period.

Note: The next state funding cycle begins July 1, 2005. When a new transit system is formed, it will need to have their AMP certified prior to receiving state funding.

What will be required in the future?

Plans will only need to be certified once. However, transit agencies must submit a letter every two years certifying that they are still meeting the requirement and identifying changes, if any, to their asset management plan.

Where do I submit my plan?

All Transit Asset Management Plans, along with a certification letter from the transit agency's general manager, should be sent to:

Barb Savary
Public Transportation and Rail
WSDOT
P.O. Box 47387
Olympia, WA 98504-7387

The plans may also be submitted to Ms. Savary electronically, as an e-mail attachment from the transit agency's general manager. Plans submitted in this manner should be sent to savaryb@wsdot.wa.gov

What does the plan framework consist of?

There are specific elements that make up the framework for the asset management plan.

1. A Mission Statement that includes a statement of the guiding principals for asset management
2. An inventory of the transit agency's assets using the same form required for the transit system's Transit Development Plan (TDP)
 - A. Include all assets as defined by the Public Transportation Management System (PTMS)
 - B. The agency sets their own replacement schedule (FTA established a minimum for vehicles. However, each agency, based on local conditions, should determine the maximum useful life of other asset types)
3. Preventative Maintenance Program
 - A. A graduated preventative maintenance (PM) program (A-B-C; or 1-2-3; etc) based on manufacturer's recommendations and adapted to local conditions
 - 1) A description of the transit agency's practices and policies that form the basis of their graduated PM program
 - 2) A general description of local conditions that effect PM service intervals of the transit agency. Local conditions include, but are not limited to: travel speed, ridership, topography, weather, local policies

- 3) The PM schedules can be modified over time as experience and technology warrant or change
 - 4) A Sample inspection sheet for each level of the PM intervals on a vehicle type that is representative of the transit agency's fleet
- B. A system to identify, track, and report maintenance, repair, and preservation activities and costs.
 - 1) An asset specific form of record keeping to track of each of the above. (This can either be a computer based system or a manual system depending on the agency's capabilities)
 - C. A process to authorize, direct, and control maintenance work activities and costs
 - 1) An established business practice to manage maintenance activities
 - D. If the transit system's assets are maintained under contract by other than the transit system's employees, describe the method used to ensure that it is performed and completed in accordance with the transit system's standards. You may include:
 - 1) Review documentation of work performed by subcontractors
 - 2) Periodic physical inspection of the assets maintained by subcontractors
 - E. A system of warranty recovery
4. A cost model that reflects the agency's policies and standards (see LLCC methodology statement). The cost model reflects the agency's policies and standards resulting the lowest maintenance costs over the life of an asset. The methodology ensures that an asset is maintained at an acceptable condition, maximizing safety and useful life.
- ➔ Note: If the transit agency already has a preventative maintenance plan, review the information in the following section, identify where the items are addressed in the plan and add any needed information.**

Preparing The Plan for Certification

This section provides guidance on the specific information that should be included under each section of the plan. The Expert Panel and PT&R developed a plan template to assist transit agencies in preparing their plan. When the transit agency prepares their plan they may either use the template or identify where each of the planning parameters is addressed in their current plan. The plan template is located in Appendix A of this guide.

What does a mission statement consist of?

A mission statement sets goals and objectives for asset management and includes the principals that guide a responsible PM program. The mission statement will vary from agency to agency. Below is a sample:

- ➔ “It is the policy of the ABC Transit Agency to adhere to an effective and proper Preventative Maintenance (PM) Program that meets or exceeds the vehicle manufacturer’s recommendations in order to ensure the availability of safe, high quality public transit services”

How do I prepare the inventory?

The asset management plan must include an inventory of all transit assets. Transit systems currently submit an annual inventory as part of their Transit Development Plan (TDP). For the purposes of the AMP, transit agencies may submit a copy of the inventory reports associated with their TDP.

During the development of the AMP parameters, the Expert Panel found that there was a great deal of confusion regarding what assets needed to be included and how to determine the condition of the assets. The following information should be used in preparing the inventory forms:

- ➔ Note: There is a separate form for each type of asset.

Rolling Stock

Include the following information for each passenger service vehicle owned by the transit agency:

- Year/Make/Model
 - The year the vehicle was manufactured
 - Make – The name of the manufacturer
 - Model – The model name or number assigned by the manufacturer

- Vehicle Code – The type of vehicle (refer to the rolling stock vehicle codes on the TDP forms in the back of this guide)
- Vehicle Identification Number (VIN) – The serial number assigned by the manufacturer
- Agency Vehicle Number – The number assigned to the vehicle by the transit agency
- Condition – The point rating that best describes the condition of the vehicle asset:
 - 100 – Only routine preventative maintenance needed
 - 80-90 – Good working order, requiring only infrequent minor repairs (more than six months between repairs)
 - 50-70 – Requires frequent minor repairs or infrequent major repairs
 - 20-40 – Requires frequent major repairs (less than six months between repairs)
 - 10 – Continued use presents excessive repair costs and potential service interruption

Note: WSDOT has not defined what constitutes a major repair versus a minor repair. For the purposes of the inventory, use your agency's policy on determining minor versus major repairs. Age – number of years since the vehicle was manufactured
- Remaining useful life – The estimated number of years the vehicle will be able to carry out its intended purpose before being replaced. FTA established the minimum useful life of buses and minibuses. However, each agency may have its own replacement schedule based on local policies and conditions.
- Replacement Cost – The current year estimated purchase price for a new vehicle of this type
- Seating Capacity – The number of seats available to the public (includes driver for vanpool vehicles)
- Fuel Type - The letter abbreviation of the type of fuel used by the vehicle. See inventory forms for a list of fuel types
- WSDOT Title – If the vehicle was purchased with grant funds through WSDOT, is the title still held by WSDOT?

Facilities

Include the following information on all facilities with a replacement value of \$25,000 or greater (including facility subsystems).

- Facility Name –The name by which the facility is most commonly referred — e.g., Battleground Park and Ride, North Base, Edmonds Ferry Terminal
- Facility Code – Identify the type of facility (refer to the facility codes on the TDP forms in the back of this guide)
- Condition – Using the same point scale described for rolling stock, identify the condition of the facility. The condition of each subsystem within the facility should be evaluated as part of the facilities condition rating. Refer to the TDP inventory form for a list of facility subsystems
- Age – Years since the facility was completed and opened for use.
- Remaining Useful Life – The estimated number of years that the facility will be able to carry out its intended purpose before replacement
- Replacement Cost – The current year estimated replacement cost for a new facility on the same site. Do not include the cost of the land on which the facility is located.

Equipment

Include the following information on all equipment with a replacement value of \$100,000 or greater.

- Equipment Code - identify the type of equipment (refer to the equipment codes on the TDP forms in the back of this guide)
- Condition – identify the numeric condition rating using the same point scale described for rolling stock
- Age – The number of years since the equipment was manufactured
- Remaining useful life – The number of years until you expect to replace the equipment
- Replacement Cost – The estimated cost, in current year dollars, to replace the equipment

Strategies

There are specific asset management strategies that should be included in your agency's plan. Below is a description of those strategies.

A graduated Preventative Maintenance (PM) program

A graduated PM program consists of established service intervals with progressively more detailed activities (A-B-C; or 1-2-3; etc) based on manufacturer's recommendations and adapted to local conditions. Each fleet type should have its own PM schedule and inspection sheets. The following information should be included in the plan:

- A statement of practices and policies that form the basis of the transit agency's graduated PM program
- A general description of local conditions that effect the PM service intervals such as:
 - Travel speed
 - Ridership
 - Topography
 - Weather
 - Local policies
- A copy of the applicable inspection sheets for a vehicle that is representative of your fleet, this should be the same vehicle you used to develop the Current Maintenance Practices cost sheet (see cost model for more information on the CP cost sheet)
 - Use the manufacturer's recommendations are used as a guideline.
 - PM schedules are modified as experience and technology warrant/change

A system to identify, track, and report maintenance, repair, and preservation activities and costs

Each agency should maintain an asset specific form of record keeping to identify, track, and report maintenance, repairs and preservation activities and costs. This may be accomplished by using a fleet management system. However, it may be easier for small agencies with very few assets to use a spreadsheet or other tracking method. Provide a description of the method used by the transit agency.

Whatever method the transit agency uses, it will need to keep track of the following information for each asset:

- Maintenance and repairs
 - Work order or some other system that describes:
 - ◆ When was the work done (date, mileage, service hours, etc.)
 - ◆ What work was done
- Preservation activities (preventative maintenance)
 - Work order or some other system that describes:
 - ◆ When was the work done (date, mileage, service hours, or other similar metered information)
 - ◆ What work was done
 - ◆ When is it due again
- Costs
 - The cost of parts and materials used for PM activities
 - Labor costs including benefits and overhead – your financial officer should be able to provide assistance with this.
 - The cost of outside services, if any
 - Warranty recovery
 - Cost of fuels and other fluids

A process to authorize, direct, and control maintenance work activities and costs

Provide a description of your organization's business practices related to managing maintenance activities. The transit agency should assign a person or position that is responsible for overseeing maintenance activities and costs. That person is responsible to ensure that the PM program is carried out in accordance with your plan and ensure that other necessary repairs are completed.

A process to oversee work done by contractors

If the transit system assets are maintained under contract by other than the transit system's employees, the plan should include a method to ensure that preventative maintenance and repairs are performed and completed in accordance with the transit system's standards. This includes:

- A periodic review of the documentation of work performed by the contractor(s)
- A periodic physical inspection of the assets maintained by the contractor(s). The physical inspection should be completed on at least a semi-annual basis.

Describe the process used by the transit agency to review the maintenance practices of your contractors and inspect the applicable vehicles.

A system of warranty recovery

The transit agency should have a process that tracks warranty repairs and ensures that a person or contractor that is certified, by the applicable manufacturer, completes the repairs. If the repairs are made by a contractor/dealer, that party will usually bill the manufacturer directly. However, if your transit system employees make the repairs you need to make sure that you obtain approval from the manufacturer(s). Describe the method used by the transit agency.

A cost model that reflects your agency's policies and standards

Include a statement in the plan that the transit agency uses the cost model or a similar life cycle cost analysis tool. To assist transit agencies with the cost analysis component, the Expert Panel developed a cost model tool. The tool will assist you in identifying the life-cycle costs and will automatically chart the information you input. The cost model was developed for maintenance professionals to easily analyze the life cycle costs of their maintenance practices and potential changes to those practices. The tool is made up of three elements.

- Current Practices (CP) cost sheet – a worksheet reflecting the life cycle costs associated with your current PM program
- Alternate Practices cost sheet – a worksheet reflecting the projected life cycle costs associated with the proposed change
- Life Cycle Cost Analysis Chart - A chart that compares the life cycle cost differences of both of the above– This chart automatically generates based on the information input on the CP and AP worksheets

The cost model may also be used to analyze the differences of life cycle costs of different fleets within your agency and to identify problem vehicles that may need to be replaced ahead of schedule.

For the purpose of certification, only the CP cost sheet is required to be attached to your plan. However, below you will find guidance on how to use the entire cost model tool. The CP cost sheet provides a financial “snap shot” of the transit agency’s preventative maintenance program.

Before preparing the CP cost sheet, select a vehicle or group of vehicles that fairly represent your agency’s fleet. This should be the same type of vehicle you chose for the sample PM inspection sheets.

While the basic components of the cost model are the same for all agencies, the costs and specific intervals identified will be unique to your system.

How do I use the cost model?

The cost model tool is designed to be “plug and play.” Your agency will only need to fill in the information related to your costs, and frequencies. The tool will automatically generate a graph based on the information you provide. Below are detailed instructions on how to use the cost model

1. Current Practices cost sheet - Select the worksheet titled “CP cost sheet.” Enter the following information
 - A. Asset Description – Enter the following base information on the type of vehicle you used for your cost model:
 - 1) Asset Type – The size and type of vehicle you are using for the cost model (i.e. 30’ Bus)
 - 2) Useful Life – Number of years your agency intends to operate the vehicle (FTA useful life definition is a minimum)
 - 3) First Cost – The initial cost of the vehicle
 - 4) Inflation Rate – The percentage rate of inflation used by your agency to project future costs.
 - 5) PM & Inspection – The average amount it costs your agency for PM and inspection
 - 6) Engine R/R – The amount it costs your agency to remove and replace an engine
 - 7) Trans R/R – The amount it costs your agency to remove and replace a transmission
 - 8) Brake Program – The average cost per vehicle for your agency’s brake program
 - 9) Tire Program – The average cost per vehicle of the agency’s tire program.
 - 10) Miles/Year – The average number of miles per vehicle accumulated each year
 - 11) Miles/PM – The mileage interval between each PM and inspection
 - 12) Engine Miles – The average number of miles you expect an engine to last
 - 13) Trans Miles – The average number of miles you expect a transmission to last
 - 14) Brake Miles – The mileage intervals used for your brake program.
 - 15) Tire Miles – The average number of miles you expect the tires to last
 - 16) Road Calls/per call – The average cost your agency incurs for a road call

- B. Maintenance Costs - Based on the information you provided under Asset & PM Description enter the following
- 1) PM & Inspection – Enter the average number of PM & Inspection cycles performed on a vehicle each year.
 - 2) Engine R/R – enter an “x” on the line corresponding to the year you expect to replace the engine
 - 3) Trans R/R – enter an “x” on the line corresponding to the year you expect to replace the transmission
 - 4) Brake Program – enter an “x” on the line corresponding to each year you expect to conduct your brake program
 - 5) Tire Program – enter an “x” on the line corresponding to each year you expect to replace the tires
 - 6) Road Calls – for each year, enter the average number of road calls per vehicle
2. Alternate Maintenance Practices – select the worksheet titled “AP cost sheet.” Enter the same information you did on the “CP worksheet” changing the information based on the anticipated effects of the change(s).
3. Chart –Select the worksheet named “chart”. Based on the information you provided in steps A and B, the chart self generates.

Where can I get help?

In addition to this guide, PT&R staff members and members of the Expert Panel are available to provide training and technical assistance to transit agencies. To request assistance please contact Barb Savary at (360) 705-7922 or Savaryb@wsdot.wa.gov

Appendix A

Plan Template

The following pages include sample text to meet the planning parameters associated with the Transit Asset Management Plan.

An electronic version of the cost model can be found on the CD located in the front of this guide. If you did not receive a CD you may download this file at:

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/sample_plan.doc

SAMPLE PLAN

XYZ TRANSIT ASSET MANAGEMENT PLAN

Mission Statement

The Maintenance Department's mission is to effectively and efficiently provide safe, clean, reliable, and comfortable vehicles for use by its customers and operators.

Graduated Preventative Maintenance Program

The emphasis of XYZ Transit System's maintenance program is preventive rather than reactive maintenance. A strong preventive maintenance program effectively reduces overall maintenance costs by decreasing the number of road calls and the high cost of unpredictable repairs caused by reactive maintenance. XYZ Transit System uses a graduated preventative maintenance program (PM) that is based on the manufacturer's recommendations and modified based on our experience and the local conditions we deal with in XYZ County. Solid PM practices maximize useful life, are cost efficient over the life of the vehicle, and ensures that our vehicles remain in safe operating condition.

XYZ Transit has an aggressive preventive maintenance program that schedules bus inspections based on a variety of categories. A PM schedule is developed for each type or group of vehicles we operate. The PM schedule established is based upon usage and vehicle type. The schedule is progressive. Each successive PM includes a higher level of maintenance inspection activity. Vehicles are inspected based on mileage and time. In addition, each vehicle receives an annual comprehensive inspection.

XYZ Transit staff continually review our maintenance practices to identify potential improvements to the program. This assures optimum benefits from the scheduled inspections. Engine oil analysis is an integral part of the inspection program. Oil analysis occurs differently for different fleet types. Some are based on mileage or hours operated. The purpose is for early identification of unusual engine wear thereby, acting to prevent catastrophic engine failures.

On-time inspection variance

The allowable variance with all preventive maintenance inspections is a minus 500 miles to a plus 500 miles. Any inspection completed within this parameter is considered on time.

Each sub-fleet has its own specific PM schedule. Samples inspection sheets used for a 30-foot Gillig coach are attached.

Local Conditions

Local conditions have a direct impact on the level of PM needed. XYZ Transit provides service throughout XYZ County. The following conditions are considered when developing a PM program for a vehicle or group of vehicles:

- Service Design
 - Urban Service – Fixed route and complimentary paratransit service. Due to the frequency of the stops and traffic congestion in the urban area, vehicles used for this service require a higher level of PM
 - Rural Area – Route deviated service. Infrequent stops in a long distance corridor
- Topography – XYZ County is located along the pacific coast. The terrain is fairly flat. However, sand and salt may cause premature ware on certain of the vehicles. Those parts are inspected more frequently than the manufacturer recommends.
- Weather – XYZ County rarely experiences inclement weather. However, the average rainfall is approx 156 inches per year.
- Local Policies
 - The XYZ Transit Board requires that all vehicles be equipped with cloth seats for the passengers. This type of seat is more difficult to clean and therefore is more costly to maintain.
 - Cleanliness – All vehicles must be cleaned daily
 - Graffiti – All graffiti must be removed within 24 hours

Authorize, Direct, and Control Maintenance Activities and Costs

The Maintenance Manager is responsible for developing the PM schedule for each vehicle fleet and ensuring that all PM activities are completed in a timely manner and consistent with the manufacturer's recommendations.

Throughout the PM and repair process the tasks performed by maintenance staff are under constant review by the Maintenance Department management and staff. This constant review is designed to ensure that review and decisions are made at the proper level of management.

Each day the Maintenance Manager prints and reviews the PM Tracking report to identify which vehicles are due or coming due for Preventative/Preservation Maintenance. The identified vehicles are removed from service and scheduled for work.

The work is then assigned to a Preventative Maintenance Technician who performs the PM and completes the appropriate PM inspection form. The technician is provided with complete instructions on how to perform the PM and is required to follows those instructions to completion. Very minor repairs such as light bulbs and the securing of fasteners etc. are done during the PM process.

XYZ Transit maintains separate PM inspection process for specific component systems such as wheelchair lifts, HVAC systems, and fare collection systems. These component systems each have their own PM schedules, forms, and tracking reports. A maintenance supervisor is charged with the task to review the tracking reports and generates the work orders to perform the tasks.

Other needed repairs may be identified during the PM inspection. These are referred to as “PM write ups”. In addition, drivers may report vehicle problems. The Supervisor and/or the Lead person review the PM write-ups and driver reports. The repairs are then scheduled into the repair shop, assigned to a mechanic and completed before the bus returns to service. A separate work order is issued for this type of repair.

Identify, Track, and Record Maintenance Activities and Costs

XYZ Transit uses a system of manual and computerized forms and reports to schedule and perform preventative/preservation maintenance (PM) and repairs to its fleet of vehicles. These documents include:

- Work orders
- Service orders
- Purchase orders
- Parts requests
- PM Tracking report
- PM Inspection forms (these vary based on type of vehicle and level of PM to be performed)

After the Maintenance Manager identifies which vehicles are due for PM, a work order is prepared that describes the work to be done, the account codes to be charged, and instructions as to which level of PM is to be performed. All the PM labor and costs are captured under the PM code on the work order. When there is a PM write-up, a new work order or multiple work orders are then generated listing those repairs. All repair labor and parts are charged to the work orders under the specific coding applicable to the individual repairs.

The required parts and supplies are assembled by the inventory department and charged to the work order. The PM work order is checked and completed by the inventory department. The inventory department then updates the PM Tracking Report to show when the PM was completed.

If a repair is determined be covered under the warranty, the appropriate coding will be identified on the work order. Any warranty parts removed from the vehicle(s) are tagged with the repair information and sent to the inventory department for storage until requested by the manufacturer/vendor. The Inventory Department submits a warranty claim to the applicable manufacturer/vendor. The inventory department tracks warranty claims via the open warranty tracking report. (See warranty Recovery Program section of this plan for more details).

Process to oversee work done by contractors

XYZ Transit contracts with a private operator for its dial a ride service. This includes maintenance of vehicles owned by XYZ Transit. The contractor is required to maintain the vehicles in accordance with our plan. To ensure compliance XYZ Transit requires the contractor to submit all work orders for preventative maintenance and repairs to our Maintenance Manager. In addition, Maintenance Department staff conduct an annual physical inspection of all Transit agency vehicles maintained by the contractor.

Warranty Recovery System

XYZ Transit operates a warranty recovery program to ensure that cost of parts and repairs on warranty-covered items are recovered.

Failed Components

Parts and components that may have failed prematurely are returned to the Inventory Department. The Inventory Division researches the original installation date, miles of usage on the failed component, and the vendor it was originally purchased from. If the part or component is covered by a warranty, it is returned to the vendor.

Return to manufacturer/vendor

Authorization for warranty return and labor claims, if applicable, are obtained from the manufacturer or vendor. Information is supplied to the vendor on the circumstances of the failure, if known. The item is then returned to the vendor warranty department for repair or replacement. XYZ Transit retains copy of the warranty claim form for tracking purposes.

Receipt from manufacturer/vendor

When a unit is received at XYZ Transit, it is entered into the inventory system via an Inventory Adjustment form that is coded as a warranty replacement. A Journal Voucher form is completed and forwarded to the Accounting Department to make the necessary accounting adjustments. Labor credit if received is applied to the appropriate cost center via a credit entry applied to the work order used when the defective part was removed.

Cost Analysis Tool

XYZ Transit's Maintenance Department uses a life cycle cost analysis tool as part of its decision-making process when establishing and making changes to preventative maintenance intervals. This enables our agency to analyze the cost effects of alternative practices over the life of the equipment.

Appendix B

Sample Cost Model

The following pages contain a sample of the cost model described earlier in this guide. The cost model was developed by the Expert Panel to provide agencies with an analysis tool for projecting the life cycle costs of their preventative maintenance program and to analyze the life cycle cost effects of changes to their program.

An electronic version of the cost model and the cost analysis tool can be found on the CD located in the front of this guide. If you did not receive a CD you may download these files at:

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/cost_model.pdf

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/cost_analysis_tool.xls

Current Maintenance Practices Cost Sheet

Asset Type	30' Bus
Useful Life	12 years
First Cost	\$ 250,000
Inflate Rate *1	3%
PM & Insp.	\$ 225.00
Engine R/R	\$ 12,000
Trans R/R	\$ 7,000
Brake program	\$ 3,000
Tire program	\$ 2,400
Miles/Year	36,000
Miles/PM	6,000
Engine Miles	300,000
Trans Miles	200,000
Brake Miles	50,000
Tire Miles	60,000
Road Calls/per call	\$ 450
Multipliers based on inflation	
Year 1	1.00
Year 2	1.03
Year 3	1.0609
Year 4	1.0927
Year 5	1.1255
Year 6	1.1593
Year 7	1.1941
Year 8	1.2299
Year 9	1.2668
Year 10	1.3048
Year 11	1.3439
Year 12	1.3842

EXAMPLE LIFE CYCLE COST ANALYSIS TOOL Current Maintenance Practices BASED ON 30' TRANSIT COACH

ASSET LIFE	PM & Inspection		Engine RR		Trans. RR		Brake program		Tire program		Road Calls		Projected Total Ownership
	# per year	Cost	Year (x)	Cost	Year (x)	Cost	Year (x)	Cost	Year (x)	Cost	# per year	Cost	
Year 1	6	\$ 1,350		\$ -		\$ -		\$ -		\$ -	6	\$ 2,700	\$ 4,050
Year 2	6	\$ 1,391		\$ -		\$ -	x	\$ 3,090	x	\$ 2,472	6	\$ 2,781	\$ 9,734
Year 3	6	\$ 1,432		\$ -		\$ -		\$ -		\$ -	6	\$ 2,864	\$ 4,297
Year 4	6	\$ 1,475		\$ -		\$ -	x	\$ 3,278	x	\$ 2,623	6	\$ 2,950	\$ 10,326
Year 5	6	\$ 1,519		\$ -		\$ -		\$ -		\$ -	6	\$ 3,039	\$ 4,558
Year 6	6	\$ 1,565		\$ -	x	\$ 8,115	x	\$ 3,478	x	\$ 2,782	6	\$ 3,130	\$ 19,070
Year 7	6	\$ 1,612		\$ -		\$ -		\$ -		\$ -	6	\$ 3,224	\$ 4,836
Year 8	6	\$ 1,660		\$ -		\$ -	x	\$ 3,690		\$ -	6	\$ 3,321	\$ 8,671
Year 9	6	\$ 1,710	x	\$ 15,201		\$ -		\$ -		\$ -	6	\$ 3,420	\$ 20,332
Year 10	6	\$ 1,761		\$ -		\$ -	x	\$ 3,914	x	\$ 3,131	6	\$ 3,523	\$ 12,330
Year 11	6	\$ 1,814		\$ -		\$ -		\$ -		\$ -	6	\$ 3,629	\$ 5,443
Year 12	6	\$ 1,869		\$ -		\$ -		\$ -		\$ -	6	\$ 3,737	\$ 5,606
TOTALS		\$ 19,159		\$ 15,201		\$ 8,115		\$ 17,450		\$ 11,008		\$ 38,318	\$ 109,252

*1 The rate used as the inflation factor is agency specific, consult your finance officer for the applicable rate in your area

Alternate Maintenance Practices Cost Sheet

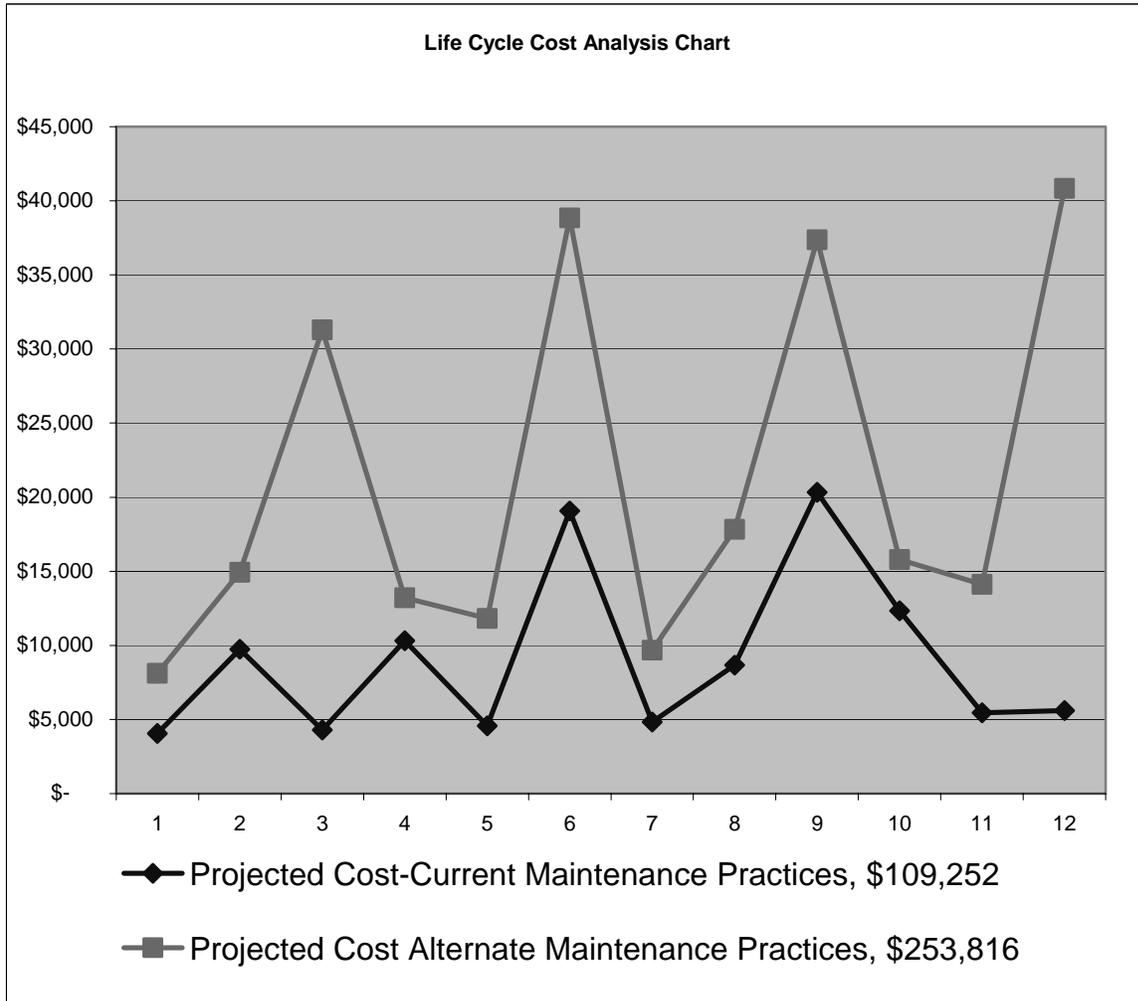
Asset Type	30' Bus
Useful Life	12 years
First Cost	\$ 250,000
Inflate Rate *1	3%
PM & Insp.	\$ 225.00
Engine RR	\$ 12,000
Trans RR	\$ 7,000
Brake Program	\$ 4,000
Tire Program	\$ 2,400
Miles/Year	36,000
Miles/PM	6,000
Engine Miles	100,000
Trans Miles	100,000
Brake Miles	55,000
Tire Miles	48,000
Road Calls/per call	\$ 450
Multipliers based on inflation	
Year 1	1.00
Year 2	1.03
Year 3	1.0609
Year 4	1.0927
Year 5	1.1255
Year 6	1.1593
Year 7	1.1941
Year 8	1.2299
Year 9	1.2668
Year 10	1.3048
Year 11	1.3439
Year 12	1.3842

EXAMPLE LIFE CYCLE COST ANALYSIS TOOL Alternate Maintenance Practices BASED ON 30' TRANSIT COACH

ASSET LIFE	PM & Inspection		Engine RR		Trans. RR		Brake program		Tire program		Road Calls		Projected Total Ownership
	# per year	Cost	Year (x)	Cost	Year (x)	Cost	Year (x)	Cost	Year (x)	Cost	# per year	Cost	
Year 1		\$ -		\$ -		\$ -		\$ -		\$ -	18	\$ 8,100	\$ 8,100
Year 2		\$ -		\$ -		\$ -	x	\$ 4,120	x	\$ 2,472	18	\$ 8,343	\$ 14,935
Year 3		\$ -	x	\$ 12,731	x	\$ 7,426		\$ -	x	\$ 2,546	18	\$ 8,593	\$ 31,297
Year 4		\$ -		\$ -		\$ -	x	\$ 4,371		\$ -	18	\$ 8,851	\$ 13,222
Year 5		\$ -		\$ -		\$ -		\$ -	x	\$ 2,701	18	\$ 9,117	\$ 11,818
Year 6		\$ -	x	\$ 13,911	x	\$ 8,115	x	\$ 4,637	x	\$ 2,782	18	\$ 9,390	\$ 38,836
Year 7		\$ -		\$ -		\$ -		\$ -		\$ -	18	\$ 9,672	\$ 9,672
Year 8		\$ -		\$ -		\$ -	x	\$ 4,919	x	\$ 2,952	18	\$ 9,962	\$ 17,833
Year 9		\$ -	x	\$ 15,201	x	\$ 8,867		\$ -	x	\$ 3,040	18	\$ 10,261	\$ 37,370
Year 10		\$ -		\$ -		\$ -	x	\$ 5,219		\$ -	18	\$ 10,569	\$ 15,788
Year 11		\$ -		\$ -		\$ -		\$ -	x	\$ 3,225	18	\$ 10,886	\$ 14,111
Year 12		\$ -	x	\$ 16,611	x	\$ 9,690		\$ -	x	\$ 3,322	18	\$ 11,212	\$ 40,835
TOTALS		\$ -		\$ 58,454		\$ 34,098		\$ 23,267		\$ 23,041		\$ 114,955	\$ 253,816

*1 Inclusion of and inflation rate is optional in calculating costs

Life Cycle Cost Analysis Chart



Appendix C

Sample Preventative Maintenance Inspection Sheets

This section contains sample inspection sheet for carrying out preventative maintenance activities. The items on these sheets should be compared to the manufacturer's recommendations and modified as necessary. Transit agencies may choose to use forms already established for the vehicles they operate.

An electronic version of the sample inspection sheets can be found on the CD located in the front of this guide. If you did not receive a CD you may download these files at:

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/PM_inspection_sheet.doc

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/PM_inspection_sheet.xls

**SAMPLE PREVENTATIVE MAINTENANCE INSPECTION SHEET
FIXED ROUTE VEHICLE INSPECTION**

Date: _____ Vehicle #: _____ Mileage: _____ Interval: _____ Inspector: _____

TYPE OF OPERATIONS TO BE PERFORMED: '/' if Okay; 'X' if Adjusted; 'O' if Repairs are Required

PM WORK ORDER NUMBER: _____

REPAIR WORK ORDER NUMBER: _____

OPERATIONAL CONTROLS		SURVEILLANCE SYSTEM	
Verify that starter will only work in Neutral		Check operation, adjustment, and damage on cameras	
Check operations of wipers and washers		Inspect recorder securement, mounts, wiring, damage	
Inspect all gauges for proper operation			
Attempt to move bus with Park Brake applied		EXTERIOR	
Check door control operation in all positions		Inspect reflectors for securement, damage, & wear	
Check throttle interlock with exit door activated		Inspect panels and skirts for secure., damage, & wear	
Check brake interlock with exit door activated		Steam clean engine and batteries	
Check throttle interlock with kneeler activated		Gently steam clean radiator core (no caustic cleaners)	
Check brake interlock with kneeler activated			
Check operation of door dump valve		TIRES AND WHEELS	
Trip door sens edge; should set alarm and open door		Inspect wheel hardware for loose lugs	
Check climate control and reheat mode		Inspect tires for damage	
Check climate control potentiometer		Check hubodometer for securement and damage	
Check blower operation on all speeds		Check for missing valve caps and damaged stems	
Verify proper blower air flow at Driver area ducting		Inspect wheels for damage, cracks, and rust trails	
Operate kneeler. Check alarm and warning lights		Check oil level in front hub oil reservoir	
Check fast idle. (switch must be off to move G-90)			
Check all exterior lights for proper operation		BATTERIES	
Check all interior lights. Lamps must cancel in Reverse		Remove corrosion and check for proper connections	
Check operation of step well lights		Check cables and terminals for fraying and routing	
Check operation of hazard lights and audible devices		Fill cells on non maintenance-free batteries	
Check operation of signal lights and audible devices		Check battery hold downs for securement and cond.	
Verify Low Air alarm and light activate @ 68-74 PSI		Check charge rate (27.8-28.2 VDC w/fast idle on)	
Check operation of mirrors, heat, and dash indicators		Apply lube to battery tray slides	
Check air buildup: 90-120 within 5 min w/fast idle on		Check alignment of battery compartment door	
Check operation of horn		Inspect battery compartment door seals	
Check operation of all indicator lamps			
Check B/U lamps and warning alarm in Reverse		UNDERCARRIAGE	
Test Destination Sign for proper operation		Check front end alignment	
Check operation of P/A, mic, amp, and foot switch		Inspect suspension components for damage and wear	
Inspect driver's seatback, bottom, lumbar, and mounts		Check for proper ride height	
Inspect operation of driver's seatbelt		Inspect drag link and ends for damage and wear	
Inspect the tilt/telescopic function of the column		Inspect tie rods for damage, wear, and securement	
Test emergency alarm/destination sign activation		Inspect steering arms for damage and securement	
		Check kingpins for excessive movement	
INTERIOR		Inspect swaybar for damage, loose/worn components	
Inspect interior for damage, wear, and grafitti		Inspect air lines for chaffing, proper clamps/routing	
Inspect flooring for damage and wear		Inspect steering gear for leaks, securement, & damage	
Inspect glass for damage or grafitti		Inspect steering lines for leaks, damage, and routing	
Check operation and condition of visors and shades		Inspect power steering pump operation and condition	
Inspect step treads for damage and wear		Inspect steering column condition and operation	
Check rails and stanchions for damage/securement		Inspect steering column u-joints for wear	
Inspect w/c belts for operation and securement		Soap test air bags and inspect for leaks and condition	
Verify there are two spare belts per vehicle		Inspect brake application valve for leaks and condition	
Inspect emergency exits for operation and decals		Inspect brake chambers for leaks and condition	
Lubricate driver's seat and check adjusters		Record lining depth. Inspect for looseness or damage	
Inspect Accident/Vomit Kit for proper inventory		Inspect fuel tank straps for condition or damage	
Check operation of window latches and slides		Inspect fuel lines for chaffing, clamps, and leaks	
Check passenger seats for damage and grafitti		Inspect fuel cap for leaks and securement	
Check chime system, dash indicator, & ADA chime		Inspect frame for cracks and damage	
Inspect fire extinguisher charge, mount, & safety seal		Verify air governor cut-out @ 120#	
Inspect First-Aid Kit for proper inventory		Inspect air brake lines for chaffing, clamps, and leaks	
Check triangle kit for damaged components		Drain air tanks. Inspect for moisture and oil	
Check air intake filters and grills; replace as needed		Inspect relay valves for leaks and damage	

Appendix D

Sample Contractor Review Checklists

This section contains two sample checklists for reviewing the preventative maintenance activities conducted by service contractors. They include:

- Checklist for transit agencies who have in-house maintenance staff
- Checklist for transit agencies who do not have mechanical expertise

An electronic version of the checklists can be found on the CD located in the front of this guide. If you did not receive a CD you may download this file at:

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/contractor_review_checklists.doc

Sample Contractor Review Checklist

30-35 FOOT DIESEL COACH

Vehicle # _____ Performed By: _____ Date: _____

Mileage _____ Work Order # _____

Includes Service A _____ B _____ C _____ D _____ E _____ Semi-Annual _____

= INSPECTED R= REPAIR MADE A= ADJUSTED N/A = NON APPLICABLE

CHECK ALL ITEMS SERVICED

START-UP

- _____ Master Switch
- _____ Neutral Start
- _____ Air Build Up (cutout 125 lbs., + or - 5 lbs.)
- _____ After air build-up, turn off vehicle, hold down brake for 1 min.
Cannot loose more than 3 lbs. pressure
- _____ Low Air PSI Alarm (alarm on by 60 PSI)
- _____ PP2 Valve Pop by 40PSI
- _____ Parking Brake

OPERATING CONTROLS

- _____ Warning Lights and Indicator Lamps
- _____ Gauges & Lighting
- _____ Door Controls
- _____ Brake Interlock
- _____ Exit Door Interlock
- _____ Defrost & Heaters
- _____ Fans
- _____ Horn
- _____ Drivers Controls & Switches
- _____ Drivers Seat & Restraint
- _____ Stop Request
- _____ Radio & PA System
- _____ Kneeling Operation
- _____ Treadle Valve Operation (Throttle and Brake)
- _____ Steering Wheel Adjustment
- _____ Destination Sign

INTERIOR INSPECTION

- _____ Interior Lights
- _____ Stanchions , Grab Handles and Rails
- _____ Emergency Windows & Exits
- _____ Roof Hatches
- _____ Door Alignment
- _____ Mirrors
- _____ Decals
- _____ Glass & Windshield
- _____ Emergency Equipment: Fire Extinguisher, First Aid Kit, Body Fluid Kit, Strap Cutter,
- _____ Triangles

EXTERIOR INSPECTION

- _____ Wiper Arms & Blades, Washer Fluid Level
- _____ Mirrors
- _____ Reflectors
- _____ Body Panels
- _____ Bumpers
- _____ Moldings
- _____ Bike Rack

TIRES AND WHEELS

- _____ Pressure
- _____ Tread Condition
- RF _____ LF _____
(minimum 5/32 front)
- _____ RRI _____ RRO
- _____ LRO _____ LRI
(minimum 3/32 rear)
- _____ Sidewall Condition
- _____ Lug Nuts
- _____ Rims

WHEELCHAIR LIFT

- Lift Operation
- Warning Light and Alarm or Override
- W/C Restraints
- Clean Tie-down Pocket
- Lift Extension Belt (Ricon Lifts Only)

UNDERCARRIAGE

- Steering Box and Joints
- Tie Rod Ends and Drag Links (replace if 1/8" movement)
- King Pin Play (max is 1/4" at top of tire)
- Shock Absorbers
- Suspension: Air Suspension, Radius & Torque Rods, Air Bags
- Brake Chambers
- Brake Lines
- Brake Diaphragms
- Brake Lining Thickness
Ft. _____ R _____
- Wheel Seals
- Check Brake Relay Valve
- Slack Adjusters
- Wheel Bearings
- Fluid Leaks
- Air Leaks
- Fuel Tank: Condition, Mounting, Lines & Vents
- Check Air Dryer for Leaks
- Axles, Differential Oil & Vent
- Underbody: Mud Flaps, Spray Guards
- Frame Cracks, Loose Crossmembers

EXHAUST SYSTEM

- Hangers
- Mufflers
- Pipes

ENGINE COMPARTMENT

- Turbo, intercooler piping, clamps and hoses
- Hydraulic Fluid
- Coolant Level
- Hoses & Clamps
- Check Belt Tension
- Air Intake (Check trap in duct.)
- Starter Cables
- Run Solenoid

BATTERIES

- Terminals & Cables
- Fluid Level
- Hold Downs
- Door Hinge Stability

ROAD TEST

- Acceleration
- Engine Performance
- Transmission Performance
- Steering Performance
- Braking Performance (Use VC3000 @ 20MPH) Record G _____
Must be 0.5000 or higher to pass brake test.
- Retarder Operation

B Inspection (add the following to the list)

- Oil
- Filter

C Inspection (add the following to the list)

- Fuel Filter
- Clean Heater Core
(Thomas ONLY)
- Rotate Tires

D Inspection (add the following to the list)

- Transmission Fluid & Filter
- Replace Air Filter
- Radiator Condition

E Inspection (add the following to the list)

- Inspect Differential Oil

Sample Contractor Review Checklist

CUTAWAYS

Vehicle # _____ Performed By: _____ Date: _____
Mileage _____ Work Order# _____
Includes Service A _____ B _____ C _____ D _____ E _____ Semi-Annual _____

= INSPECTED R= REPAIR MADE A= ADJUSTED N/A = NON APPLICABLE

CHECK ALL ITEMS SERVICED

OPERATING CONTROLS

_____ Ignition Switch
_____ Neutral Start
_____ Warning Lights and Indicator Lamps
_____ Gauges & Lighting
_____ Parking Brake
_____ Door Controls
_____ Brake Interlock
_____ Exit Door Interlock
_____ Defrost & Heaters
_____ Fans
_____ Horn
_____ Drivers Controls & Switches
_____ Drivers Seat & Restraint
_____ Stop Request
_____ Radio
_____ Steering Wheel Adjustment
_____ Destination Sign, if applicable

INTERIOR INSPECTION

_____ Interior Lights
_____ Stanchions, Grab Handles and Rails
_____ Emergency Windows & Exits
_____ Roof Hatches
_____ Door Alignment
_____ Mirrors
_____ Decals
_____ Glass & Windshield
_____ Emergency Equipment: Fire
Extinguisher, First Aid Kit, Body Fluid
Kit, Strap Cutter, Triangles

EXTERIOR INSPECTION

_____ Wiper Arms & Blades, Washer Fluid
Level
_____ Mirrors
_____ Reflectors
_____ Body Panels
_____ Bumpers
_____ Moldings
_____ Bike Rack
_____ Curb Feelers

TIRES AND WHEELS

_____ Pressure
_____ Tread Condition RF _____ LF _____
(minimum 5/32 front)
RRI _____ RRO _____ LRO _____
LRI _____
(minimum 3/32 rear)
_____ Sidewall Condition
_____ Lug Nuts
_____ Rims

WHEELCHAIR LIFT

_____ Lift Operation
_____ Warning Light and Alarm or Override
_____ W/C Restraints
_____ Clean Tie-down Pocket
_____ Lift Extension Belt (Ricon Lifts Only)

UNDERCARRIAGE

- Steering Box and Joints
- Tie Rod Ends and Drag Links (replace if 1/8" movement)
- Ball Joints
- Shock Absorbers
- Suspension: Air Suspension, Radius & Torque Rods, Air Bags
- Brake Lines
- Brake Lining Thickness
Ft. _____ R _____
- Wheel Seals
- Wheel Bearings
- Fluid Leaks
- Air Leaks
- Fuel Tank: Condition, Mounting, Lines & Vents
- Axles, Differential Oil & Vent
- Underbody: Mud Flaps, Spray Guards
- Frame Cracks, Loose Crossmembers

EXHAUST SYSTEM

- Hangers
- Mufflers
- Pipes

ENGINE COMPARTMENT

- Power Steering Fluid
- Coolant Level
- Brake Fluid
- Hoses & Clamps
- Check Belt Tension
- Starter Cables
- Radiator & Fan Shroud
- Fan

BATTERIES

- Terminals & Cables
- Fluid Level
- Hold Downs

ROAD TEST

- Acceleration
- Engine Performance
- Transmission Performance
- Steering Performance
- Braking Performance (Use VC3000 @ 20MPH) Record G _____
Must be 0.5000 or higher to pass brake test.

B Inspection (add the following to the list)

- Oil
- Filter

C Inspection (add the following to the list)

- Rotate Tires

D Inspection (add the following to the list)

- Replace Air Filter
- Transmission Fluid & Filter
- Wheel Bearings
- Inspect Differential Oil, change if needed
- Fuel Filter

Sample Contractor Review Checklist For Agencies with No Maintenance Staff

Physical Inspection

1) Under the hood

- A. Belts, frayed
- B. Hoses, cracked
- C. Engine block, clean of oil, coolant etc. Hood light operative.
- D. Check all fluid levels oil, coolant, power steering fluid.

2) Exterior Walk-around

- A. Fluid leaks under coach.
- B. Suspension, coach sagging any direction, check front end bounce up and down to check shocks on smaller coaches. Should go down and up only 1 x. Visual on leaf springs-nothing hanging that shouldn't be.
- C. Obvious cleanliness of coach
- D. All exterior lamps working, clearance, license plate light, tail, turn and 4-ways.
- E. Unreported body damage/scratches.

3) Interior Check

- A. All interior lights working, including dimmer switch.
- B. Check all wheelchair tiedowns for cleanliness, proper # of and order of tiedowns.
- C. Seat condition, clean, no cuts or stains in vinyl or upholstery.
- D. Check seats that raise for wheelchair stations for smoothness of operation.
- E. First Aid Kit - full, strap cutter, Body Fluid Cleanup - full, triangles neatly folded and secured with proper number needed.

- F. Fire Extinguisher secure and tag not expired.
- G. Dash lights all operative, check all switches for operation, wiper blades in good condition, washer fluid full, horn, backup alarm in reverse.

4) Wheelchair lift operation

- A. Lift clean
- B. Check override on lift belt, is light operating?
- C. Smoothness of operation on lift outboard barrier.
- D. Check override that lift will not work without vehicle being in Park with Emergency Brake on and W/C switch activated at driver seat.

Documentation

For each vehicle maintained by the service contractor:

1) What are the required maintenance intervals for the vehicle(s)? _____

2) Do the contractor's records reflect that they are performing preventative maintenance in a timely manner? _____

Comments:

Appendix E

Sample Inventory Forms

This section contains copies of the Public Transportation Management System inventory forms to be attached to your plan. These are the same forms used for the inventory submitted in conjunction with your Transit Development Plan (TDP).

An electronic version of the PTMS inventory forms can be found on the CD located in the front of this guide. If you did not receive a CD you may download this file at:

http://www.wsdot.wa.gov/transit/asset_mgmt_plan/inventory_form.xls

You may also submit copies of the forms prepared as part of your agency's TDP. These forms include:

- Rolling Stock
- Equipment
- Facilities

Public Transportation Management System

Owned Rolling Stock Inventory

I hereby certify that all information reported in this inventory reflects true, accurate and complete information for the agency/organization listed.													
											Signature and Title		Date
Agency/Organization:													
Date:													
Year/Make/Model	Vehicle Code	Vehicle Identification Number (VIN)	Agency Vehicle Number	Current Odometer	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost \$	ADA Access (yes/no)	Seating Capacity	Fuel Type	WSDOT Title (yes/no)	
1.													
2.													
3.													
4.													
5.													
6.													
7.													
8.													
9.													
10.													
11.													
12.													
13.													
14.													
15.													
16.													

**Public Transportation Management System
Owned Equipment Inventory**

Agency/Organization: _____

Date: _____

	Equipment Code and Description	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost (\$)	Comments <i>(if more than two lines, please attach a separate comment page)</i>
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						

Owned Facility Inventory

Agency/Organization: _____

Date: _____

Facility Code	Facility Name	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost (\$)	Comments <i>(if more than two lines, please attach a separate comment page)</i>
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						

Owned Facility Inventory

Agency/Organization: _____

Date: _____

Facility Code	Facility Name	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost (\$)	Comments <i>(if more than two lines, please attach a separate comment page)</i>
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						