

**Twin Cities Area
Transportation Authority**

Vehicle Maintenance Plan

Board Chairman _____

Approval Date _____

Twin Cities Area Transportation Authority

Vehicle Maintenance Plan

Maintenance Policy Statement

The goal of the Twin Cities Area Transportation Authority Vehicle Maintenance Policy is to ensure the safe and reliable operation of all vehicles entrusted to the agency, to provide a secure and dependable working environment for our drivers, and to promote a clean and comfortable experience for our passengers. We accomplish this goal through four primary ways:

- Daily Pre-Trip and Post-Trip Inspections
- Routine Service and Preventative Maintenance
- Semi-Annual Safety Inspections
- Accurate and Timely Record Keeping

Daily Inspections and Cleaning

Daily pre-trip and post-trip inspections confirm the safe condition of all essential vehicle functions. An inspection will be performed each time a vehicle leaves the facility. These visual inspections are conducted by the driver both before and after their shift and recorded on a paper form (See attachment A). If a vehicle has significant defects, it will be scheduled for repair and held out of service until repairs are completed. The inspection form will be held in a maintenance office file dedicated to that vehicle. If any repairs are needed, the maintenance coordinator will create a work order and submit that along with the inspection form to the office for the vehicle's permanent record.

TCATA vehicles interiors and exteriors are cleaned daily. The TCATA bus washer, under the supervision of the Maintenance Coordinator and Operations Manager, is responsible for exterior cleaning using the power washer and interior cleaning of all frequently touched surfaces daily and a more complete interior cleaning on a weekly basis.

Routine Service and Preventative Maintenance

Preventative Maintenance (PM) involves performing regularly scheduled maintenance services, adjustments, and inspections based on a predetermined interval of miles to ensure the safe operation of vehicles and to maximize the useful life of all FTA funded assets. Performing Multi-Point Inspections and oil changes are examples of preventative maintenance. TCATA maintenance staff conducts both monthly and every 7500-mile PM in accordance with manufacturer's recommended service intervals (See attachment B). TCATA operations staff track the vehicle PM record and issue a PM checklist to the maintenance coordinator. These are issued when the scheduled service interval is 500 miles or less from the designated maintenance threshold. The maintenance coordinator then schedules and conducts PM in a timely manner that ensures that the work is done before the scheduled mileage and with a minimum of disruption to regular service. As part of our monthly PM, the wheelchair lifts and bus security cameras undergo inspection and maintenance as required. (See attachment D)

Regular, proactive preventative maintenance is fundamental to our overall maintenance program. Promptly making necessary repairs and adjustments help to reduce subsequent expensive damage later and helps us maintain operational vehicle safety. TCATA operations staff retains status on all necessary work to be performed, the TCATA maintenance coordinator is responsible for making sure the work is completed, and the Operations Manager and Executive Director are responsible for regular oversight to ensure that work is conducted in a timely, cost-effective manner.

Semi-Annual Safety Inspections

TCATA's Semi-Annual Safety Inspection is a thorough, detailed, twice-a-year inspection of all our vehicle assets with the goal of ensuring that every part and function of our vehicles is in good working order. The *Vehicle Safety Inspection Checklist* enumerates 106 items we inspect (See attachment C). Technicians who conduct these inspections are required to be certified for the class of vehicles we use, so we subcontract this work to D&S Heavy Duty Truck and Trailer Repair, Inc. of Sodus, Michigan. TCATA office staff identifies buses scheduled for safety inspections and notifies D&S who completes the work based on an existing contract. Inspection records are then kept in the vehicle maintenance file. The Operations Manager and Executive Director are responsible for regular oversight to ensure all buses are being inspected semi-annually.

Record Keeping

Keeping accurate, detailed, and complete vehicle maintenance records is essential to ensuring that TCATA's vehicles are properly maintained. Each vehicle has its own maintenance file, and all vehicle maintenance becomes part of the vehicle's historical record. Each individual vehicle's file includes all daily inspections when an issue is identified, semi-annual safety inspections, and mileage based preventative maintenance records.

Warranties

A warranty is a manufacturer's assurance that a product will perform properly for a specific time or usage level. If a product fails to meet this assurance, the manufacturer is obligated to make restitution. This restitution usually consists of one or a combination of the following:

- Replace the defective item
- Repair the defective item
- Reimbursement for the cost of having item repaired
- Furnish a replacement part

The primary importance of a warranty program is that it partially offsets the cost of maintaining a vehicle. Warranties cover new vehicles, many new/replacement parts, and most vendor's work. Any compensation from the manufacturer for the costs incurred saves TCATA money.

TCATA operations keeps a spreadsheet on all equipment covered under warranty. This information includes the name of the item, date of purchase, period of warranty, and what is covered under the warranty. Before any repair work is done or any item is repaired, TCATA office staff checks to ensure if the work is covered under the warranty.

Training

Effective training is essential to the proper diagnosis of vehicle problems and their subsequent repair or replacement. As vehicles become increasingly complex and reliant upon electronic and computerized controls and monitoring systems, the need for adequate training becomes that much more important. TCATA management is committed to providing maintenance personnel with the training required to do their jobs properly. Maintenance personnel attend the annual MDOT sponsored Transit Vehicle and Maintenance Seminar annually and additional training as required.

ATTACHMENT A

Daily Pre-trip and Post Trip Inspection

TWIN CITIES AREA TRANSPORTATION AUTHORITY

PRE/POST-TRIP INSPECTION FORM

Complete this form at each shift beginning and end then submit it to the dispatch office.

Mark each line either OK or Needs Repair.

Driver _____ Bus# _____ Date _____

Starting Odometer _____ Ending Odometer _____

<u>Exterior</u>	<u>Pre-Trip</u>	<u>Post-Trip</u>	<u>Repair</u>	<u>Interior</u>	<u>Pre-Trip</u>	<u>Post-Trip</u>	<u>Repair</u>
Body Damage	___	___	___	Seat Belts	___	___	___
Tires	___	___	___	Wheelchair	___	___	___
Lug Nuts	___	___	___	Emerg. Exits	___	___	___
Cycle Lift	___	___	___	Horn	___	___	___
<u>Lights/Reflectors</u>				Wiper/Washer	___	___	___
Interior Lights	___	___	___	Fire Extinguisher	___	___	___
Headlights	___	___	___	Triangles	___	___	___
Turn Signals	___	___	___	Fuel Gauge	___	___	___
Brake Lights	___	___	___	Steering Play	___	___	___
Running/Clearance	___	___	___	Parking Brake	___	___	___
Stepwell Lights	___	___	___	Heater/AC	___	___	___
Hazard/4 way	___	___	___	2 Way Radio	___	___	___
Tail Lights	___	___	___	Cleanliness	___	___	___
Back-up Lights	___	___	___				

Driver Comments

Mechanic Comments (No action taken, repair pending, repair complete, work order#, etc.)

Mechanic Signature _____ Date _____

ATTACHMENT B

PREVENTATIVE MAINTENANCE CHECKLISTS

Twin Cities Area Transportation Authority

MONTHLY

Bus Preventative Maintenance Checklist

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

____ Check engine oil Level.

____ Check function of all interior and exterior lights.

____ Check tires including spare for wear and proper pressure.

____ Check windshield washer fluid level.

____ Preventative Maintenance of Wheelchair Lifts (see checklist)

____ Preventative Maintenance of Bus Security Cameras (see checklist)

COMMENTS _____

Twin Cities Area Transportation Authority

MULTI-POINT INSPECTION CHECKLIST

(To be done at every scheduled maintenance)

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

- ___ Check accessory drive belt(s)
- ___ Check battery performance
- ___ Check engine air filter
- ___ Check exhaust system
- ___ Check exterior lamps and hazard warning system operation
- ___ Check fluid levels; fill if necessary
(Brake, coolant recovery reservoir, automatic transmission, power steering and window washer)
- ___ Check for oil and fluid leaks
- ___ Check horn operation
- ___ Check radiator, cooler, heater, and A/C hoses
- ___ Check suspension component for leaks or damage
- ___ Check steering and linkage
- ___ Check tires (including spare) for wear and proper pressure
- ___ Check windshield for cracks, chips, or pits
- ___ Check washer spray and wiper operation

Twin Cities Area Transportation Authority

7,500/22,500/37,500/52,500/67,500/82,500/112,500/
127,500/142,500/157,500/172,500/187,500/202,500

Mile Bus Preventative Maintenance Checklist (Circle One)

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

____ Perform Multi-Point Inspection (Use multi point inspection checklist).

____ Change engine oil and filter.

____ Rotate front tires, inspect tire wear, and measure tread depth.

____ Inspect wheels and related components for abnormal noise, wear,
Looseness, or drag.

COMMENTS _____

Twin Cities Area Transportation Authority
15,000/45,000/75,000/135,000/165,000/195,000

Mile Bus Preventative Maintenance Checklist
(Circle One)

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

___ Perform Multi Point Inspection (Use multi point inspection checklist)

___ Change engine oil and filter.

___ Rotate front tires, inspect tire wear and measure tread depth.

___ Inspect wheels and related components for abnormal noise, wear,
looseness, or drag.

___ Inspect automatic transmission fluid level.

___ Inspect brake pads, rotors, hoses, and parking brakes.

___ Inspect engine cooling system strength and hoses.

___ Inspect exhaust system and heat shields.

___ Inspect steering linkages, ball joints, suspension, tie rod ends, driveshaft,
and U-Joints.

Comments _____

TWIN CITIES AREA TRANSPORTATION AUTHORITY

30,000/90,000/120,000/180,000

Mile Preventative Maintenance Checklist

(Circle One)

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

_____ Perform Multi-Point Inspection (Use multi point inspection checklist).

_____ Change engine oil and filter.

_____ Rotate front tires, inspect tire wear, and measure tread depth.

_____ Inspect wheels and related components for abnormal noise, wear, looseness, or drag.

_____ Inspect automatic transmission fluid level.

_____ Inspect brake pads, rotors, hoses, and parking brake.

_____ Inspect engine cooling system strength and hoses.

_____ Inspect exhaust system and heat shields.

_____ Inspect steering linkages, ball joints, suspension, tie rod ends, driveshaft, and U-joints

_____ Replace engine air filter.

COMMENTS _____

Twin Cities Area Transportation Authority

60,000/120,000/180,000

Mile Bus Preventative Maintenance Checklist

(Circle One)

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

Perform Multi Point Inspection (Use multi point inspection checklist)

Change engine oil and filter.

Rotate front tires, inspect tire wear, and measure tread depth.

Inspect wheels and related components for abnormal noise, wear, looseness, or drag.

Inspect automatic transmission fluid level.

Inspect brake pads, rotors, hoses, and parking brakes.

Inspect engine cooling system strength and hoses.

Inspect exhaust system and heat shields.

Inspect steering linkages, ball joints, suspension, tie rod ends, driveshaft, and U-Joints.

Replace engine air filter.

Change automatic transmission fluid and filter.

Replace front wheel bearing grease and grease seal if non-sealed bearings are used.

Comments _____

Twin Cities Area Transportation Authority

97,500

Mile Bus Preventative Maintenance Checklist

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

____ Perform Multi Point Inspection (Use multi point inspection checklist).

____ Change engine oil and filter.

____ Rotate front tires, inspect tire wear, and measure tread depth.

____ Inspect wheels and related components for abnormal noise, wear,
looseness, or drag.

____ Replace spark plugs.

____ Replace rear axle fluid.

Comments _____

Twin Cities Area Transportation Authority

105,000

Mile Bus Preventative Maintenance Checklist

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

____ Perform Multi Point Inspection (Use multi point inspection checklist)

____ Change engine oil and filter.

____ Rotate front tires, inspect tire wear, and measure tread depth.

____ Inspect wheels and related components for abnormal noise, wear, looseness, or drag.

____ Inspect automatic transmission fluid level.

____ Inspect brake pads, rotors, hoses, and parking brake.

____ Inspect engine cooling system strength and hoses.

____ Inspect exhaust system and heat shields,

____ Inspect steering linkages, ball joints, suspension, tie rod ends, driveshaft, and U-Joints.

____ Change engine coolant.

____ Inspect accessory drive belts.

Comments _____

Twin Cities Area Transportation Authority

150,000

Mile Bus Preventative Maintenance Checklist

Requested by: Name _____ Date _____ Bus # _____

Serviced by: Name _____ Date _____ Odometer _____

- ___ Perform Multi Point Inspection (Use multi point inspection checklist).
- ___ Change engine oil and filter.
- ___ Rotate front tires, inspect tire wear, and measure tread depth.
- ___ Inspect wheels and relate components for abnormal noise, wear, looseness, or drag.
- ___ Change automatic transmission fluid.
- ___ Change automatic transmission filter.
- ___ Replace accessory drive belts if not replaced within the last 100,000 miles (about 160934.4 km).
- ___ Replace front wheel bearings and seals if non-sealed bearings are used.
- ___ Inspect brake pads, rotors, hoses, and parking brake.
- ___ Inspect engine cooling system strength and hoses.
- ___ Inspect exhaust system and heat shields.
- ___ Inspect steering linkages, ball joints, suspension, tierod ends, driveshaft, and U-Joints.
- ___ Replace engine oil filter.

Comments _____

ATTACHMENT C

Semi-Annual Vehicle Safety Inspection Checklist

Exhibit #3 – Sample Safety Inspection Form					
VEHICLE SAFETY INSPECTION CHECKLIST					
Vehicle safety inspections are required every six months.					
Put an X in the box for ok, O for needs attention, or NA for does not apply					
VEHICLE NO.		TRANSIT AGENCY			
MAKE	MODEL	YEAR	MILEAGE	V.I.N.	
TECHNICIAN SIGNATURE			MECHANIC CERTIFICATION NO.		INSPECTION DATE
A	GENERAL CONDITION	J	SAFETY EQUIPMENT		71. Volt/Amp Gauge
	1. Body, Bumpers, Trim		35. Flares/Reflector Triangles		72. Oil Pressure Gauge
B	TIRES/BATTERY	K	DRIVER'S SEAT		73. Engine Temperature Gauge
	2. Tread depth		36. Fire Extinguisher Charge/Date		74. Air System Pressure Gauge
	3. Tire Pressure		37. firmly Mounted		75. Low Air Pressure Light/Alarm
	4. Wheels & Lug Nuts		38. Adjusts & Latches		76. Speedometer/Odometer
	5. Battery Terminals & Compartment		39. Seatbelt Operation		77. Air Restriction Gauge/Induction System
C	FLUIDS	L	HEATER/DEFROSTER	Q	BRAKES
	6. Engine Oil Level		40. Fans Operate F/R		78. Parking Brake
	7. Coolant Level/Freeze Protection ° F		41. Heaters Operate F/R		79. Brake Pedal Low/ Soft? Hard? Normal?
	8. Brake Fluid Level		42. Defroster Operation		80. Brakes Pull, Noisy
	9. Transmission Fluid Level		43. Air Conditioner System Operation		81. Air Chambers/Slack Adjusters
	10. Power Steering Fluid Level	M	LIGHTS, HORN		82. Air Lines/Tanks/Drains
	11. Windshield Washer Fluid Level		44. Stepwell	R	TRANSMISSION-DRIVE TRAIN
D	DOORS		45. Passenger Area		83. Holds in Park Position
	12. Open & Close Properly		46. High Beam Headlights & Indicator		84. Does Not Start in Gear
	13. Won't Open Accidentally		47. Low Beam Headlights		85. U-Joints
	14. Latches, Handrails, Hinges		48. Dimmer Switch		86. Differential/Rear Axle
	15. Seals Out Fumes & Dust		49. Turn Signal Lights & Indicators	S	STEERING
E	FLOORS & STEPS		50. Hazard Flashers & Indicators		87. Free Play
	16. Clean & Free of Debris		51. Running Lights		88. Steering Force
	17. Loose Floor Covering/Weak Flooring		52. Reflectors		89. Pulls in Either Direction
	18. Step Tread Covers & Fasteners		53. Brake Lights		90. Power Steering Pump/Gear Box
F	SEATS		54. Tail Lights		91. Linkage/Ball Joints/King Pins
	19. Sharp Edges/exposed Metal		55. License Plate Light	T	SUSPENSION F/R
	20. Upholstery/Springs		56. Back-up Lights		92. Shocks/Mounts/bushings
	21. Firm Mounting		57. Back-up Alarm		93. Springs/Clamps/Shackles
G	GRAB-RAIL STANCHIONS		58. Horn		94. Stabilizers/Tracking Bars/Bushings
	22. Padded Properly	N	WIPER/WASHER	U	EXHAUST SYSTEM
	23. Firmly Mounted		59. Arm Tension		95. Exhaust/Tail Pipes
	24. Other Padding		60. Blade Condition		96. Muffler/Catalytic Converter
H	WINDOWS		61. Wiper/Washer Switch w/Delay		97. Hangers/Clamps
	25. Safety Glass		62. Washer Aim & Coverage	V	FUEL SYSTEM
	26. Vision Obstruction	O	MIRRORS		98. Lines/Fittings/Filter
	27. Operation		63. Mounted Firmly		99. Leaks
	28. Sun Visors		64. Interior View		100. Tank Mounts/Drain/Fill Cap
I	EMERGENCY EXITS		65. Exterior Flat Rear View	W	LIFT/RAMP/SECUREMENTS
	29. Doors/Windows Work Properly		66. Exterior Convex Rear View		101. Remote Control
	30. Doors/Windows Latch Properly		67. Exterior Front Cross View		102. Wheelchair Stops/Handrails
	31. Roof Hatch Operation	P	ENGINE OPERATION		103. Restraints/Tie Downs Operation
	32. Labeled Properly		68. Starting		104. Stop Request
	33. No Obstruction to EXITS		69. Excessive Smoking		105. Adequate Padding
	34. Door Ajar Warning Alarm		70. Instrument Warning Lights		106. Manual Lift Operation

REMARKS: