Miami-Dade Transit
Track & Guideway Division
Equipment and Maintenance Plan

Picture under development

April 2006

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Track & Guideway Division
Equipment & Maintenance Plan

Introduction

This document is a statement of the processes and practices by which Miami-Dade Transit (MDT) establishes proper maintenance of the Metrorail track and the Metrorail and Metromover guideway systems; station structures, pedestrian overpasses, parking garages, and equipment required for track and structural maintenance through the Track & Guideway Division. It describes the organization of the Track & Guideway Division, details the assignment of responsibility for the Metrorail track and Metrorail and Metromover guideway systems, station structures pedestrian overpasses, parking garages and equipment required for track and structural maintenance. It outlines inspections and routine maintenance actions designed to ensure proper care and maximum useful service life, and presents the record-keeping system used to maintain permanent records of maintenance and inspection activity for the Metrorail track and the Metrorail and Metromover guideway, parking garages, pedestrian overpasses, Metrorail and Metromover stations and equipment required for track and structural maintenance.

Track & Guideway Division processes and practices, as outlined in this plan, comply with Federal Transit Administration (FTA) Circular 5010.1C, Chapter II, 3e(5) and Circular 9030, Chapter V 5e.

This plan is a living document based on current realities and assumptions and is, therefore, subject to future revision. This plan is updated on a regular basis to assist in the planning and operation of the MDT Track & Guideway Division.

The Track & Guideway Equipment & Maintenance Plan is structured to present an overview of the MDT Track & Guideway Division followed by a discussion of current operating practices in terms of preventive maintenance, rehabilitation and renovation, and replacement in Section Two. Section Three of the plan identifies track & guideway systems, parking garages, pedestrian overpasses, station structures and track and structural maintenance equipment inventories and estimates current and future demands for preventive maintenance and repairs. Section IV translates the identified demands into maintenance manpower requirements. Warranty recovery maintenance plan requirements, including identification, recovery, and enforcement, are presented in Section V. The maintenance plan is summarized in Section VI.

I. Overview of MDT Track & Guideway Division

Miami-Dade Transit

The Track & Guideway Division is responsible for the maintenance of the Metrorail track and the Metrorail and Metromover guideway systems, including station structures parking garages and pedestrian overpasses and all required equipment for track and structural maintenance for Miami-Dade Transit (MDT), the transit department within Miami-Dade County government. MDT, which is the 16th largest public transit system in the country and the largest transit agency in Florida, is responsible for marketing and providing all public transit services in the County.

The Miami-Dade County integrated public transportation system consists of four major components:

- Metrobus fleet, providing service 24 hours per day and connecting most areas of Miami-Dade County;
- Metrorail, an electrically powered, elevated rapid transit system that operates 20 hours per day stretching over 22 miles, from Dadeland through Hialeah to the Palmetto Expressway in Medley;
- Metromover, a 4.59-mile elevated people mover system, operating 20 hours per day, that serves Miami's downtown Central Business District, including Omni and Brickell; and,
- Paratransit, which provides two services: Medicaid Transportation and Special Transportation Services (STS).

MDT's annual operating budget is funded through direct operating revenues (passenger fares, passes, etc.), non-operating revenue that includes advertising, joint development leases, etc., the State of Florida's Department of Transportation and the Transportation Disadvantaged Trust Fund, and Miami-Dade County government. Funding for the capital budget falls into two categories: funds for rehabilitation or replacement of existing capital assets and funds spent for acquisition of new capital assets or expansion. A combination of federal, state, and local sources provide funding for these categories.

On November 5, 2002, Miami-Dade County voters approved a one-half percent increase in the sales tax to be used exclusively for improving transportation in Miami-Dade County and the creation of a Citizen's Independent Transportation Trust (CITT) to implement the People's Transportation Plan (PTP). PTP

mandated service enhancements include free fares for all residents 65 or older or who are Social Security beneficiaries; free Metromover for all passengers; 20-hour service on Metromover, STS, and 11 Metrobus routes; and, more frequent Metrorail and Metrobus service in peak and off-peak periods, Metrobus route extensions, and other schedule adjustments to improve on-time performance.

The significant growth that MDT has experienced over the years is expected to continue into the future. MDT's unified transit system daily boardings of 270,000 are projected to increase to 300,000 within the next three years as the Metrobus fleet expands from 760 to 1,191 buses in the next five years. A new maintenance facility will be available next year; approximately 3,000 bus passenger solar-energized shelters will be installed; and, the South Miami-Dade Busway will be opened all the way to Florida City. Projected fiscal year (FY) 2004 increases in operating miles for Metrobus, Metrorail, and Metromover are illustrated in the following table:

Mode	*Operating Miles*	*Actual New Miles*	*% Increase*	*PTP % Increase*
Metrobus				
FY 2003 before PTP	30,413,828			
FY 2003 with PTP	33,497,300	3,083,500	10.10%	
FY 2004 with PTP	37,172,166	3,674,866	11.00%	22.20%
Metrorail				
FY 2003 before PTP	7,549,172			
FY 2003 with PTP	8,869,600	1,320,428	17.50%	
FY 2004 with PTP	9,523,660	654,060	7.40%	26.20%
Metromover				
FY 2003 before PTP	1,028,215			
FY 2003 with PTP	1,108,678	80,463	7.80%	
FY 2004 with PTP	1,276,500	167,822	15.10%	24.10%

Brief History

The Track & Guideway Division was established in 1983 with approximately 10 employees assigned to the division prior to passenger service and a Bridge Inspection Program. There were many punch-list items, which were completed by the division, including acoustical barrier installation, anchor bolt removal and replacement, bearing pad repairs, and power rail coverboard installation.

In 1984, the Metrorail system opened, and a Track Inspection Program was developed. Metrorail structures were inspected for the first time by an MDT

consultant contracted to develop the Bridge Inspection Program. The first inspection was designed to establish a baseline for the future Bridge Inspection Program. The responsibility for the Bridge Inspection Program then became a joint effort of the Track & Guideway structural maintenance staff and Transit Engineering.

Initially the Track & Guideway Division operated independently, and although there were specific classifications for each employee, it was understood that everyone was required to do everything when necessary. The division was managed by a General Superintendent who reported to the MDT Assistant Director.

Today, activities of the Track & Guideway Division reside within Rail Services and are directed by the Rail Track & Guideway General Superintendent, who reports to the Assistant Director Rail Services. The FY 2005 Division budget includes a total of 136 staff, functionally divided into 4 major operating areas: The Division office, Rail Structures, Rail Track, and Rail Shop, each under the leadership of a Chief (your new chart shows track and shop as Supervisor rather than Chief Supervisor) Supervisor with the exception of the Division Office.

Present inventories indicate that Track & Guideway Division is responsible for the maintenance of over 22 miles of track, 2,748 girders, 2,413 columns, and 22 stations on Metrorail, including 6 parking garages and 3 pedestrian overpasses. The Metromover inventory consists of 666 girders, 435 columns, and 21 stations, including 57.09 miles of track and power rail including switches. The inventory also contains over 248 individual pieces of equipment, which is maintained and operated by the Track Shop Section.

Mission

In 1984, key staff within MDT's Track & Guideway Division developed the division's mission statement for inclusion in the Track and Guideway Strategic Plan. The staff wanted the statement to reflect the Division's responsibilities and goals.

> *The Track and Guideway Division is responsible for maintaining the track and guideway systems to permit revenue service at speeds up to seventy miles per hour. It is responsible for providing support to Rail Transportation, Systems Maintenance and Rail Vehicle Maintenance Divisions. This Division plans, directs, and coordinates all track and guideway maintenance issues required to perform the above service. This Division enforces safety policies and emergency procedures and*

maintains good relations with all interfacing sections, labor unions and its employees.

Purpose/Philosophy

The Track & Guideway Division is comprised of four distinct organizational sections for the distribution of responsibilities. The four sections are:

- Division Office
- Structural Inspection and Maintenance
- Track Inspection and Maintenance
- Shop Maintenance, Repair, and Operation of Track and Structure Equipment

The Track & Guideway Division manages and maintains over 44 miles of mainline track and approximately 9 miles of yard track, with associated power rails. In addition, the Division is responsible for the repair and maintenance of 20 miles of elevated structure, 22 stations, 6 parking garages and 3 pedestrian overpasses along with 4.59 miles of elevated guideway for the Metromover and 21 stations. These efforts require the close and continuous inspection of various elements of the systems.

The Track & Guideway Division is responsible for maintaining the track and guideway systems to permit passenger service at speeds up to 70 miles per hour. The Division provides support to Rail Transportation, Facilities Maintenance and the Rail Vehicle Maintenance Divisions. Track & Guideway plans, directs, and coordinates all track and guideway maintenance requirements to perform the above service. Track & Guideway enforces safety policies and emergency services and subscribes to the philosophy that planned and adequate maintenance are the foundation of quality reliability, continuous service, and cost-effective repairs.

Objectives

- Track & Guideway Availability – to ensure track & guideway systems and station structures are safe for the general public as well as passengers, and operational and available to customers and employees.

- Equipment Availability – to ensure that track & guideway equipment, including light and heavy shop equipment, is maintained for maximum availability and safety.

- Track & Guideway Appearance – to ensure that track & guideway and station structures are clean and present a safe and comfortable environment for customers and employees. This includes pressure washing acoustical barrier panels, station fascia panels and weekly cleaning of trash in the tracks through the stations.

- Track & Guideway Improvements – to modify or change existing track & guideway systems and station structures in support of on-going operations within engineering and code requirements.

Span of Control

The Track & Guideway Division is responsible for a variety of in-house and contracted services for Miami-Dade County. These services include but are not limited to:

Maintenance and Repair (Metrorail)

- Track
- Track and tie replacement
- Switch replacement
- Frog point maintenance
- Rail grinding
- Track fastener replacement
- Inspection
- Work orders generated by the Inspection Program
- Track cleaning in station areas

Structural Maintenance

- Metrorail guideway
- Metromover guideway
- Metrorail stations
- Metromover stations
- Parking garages
- Pedestrian overpasses
- Equipment required for track and structural maintenance
- Preventive Maintenance
- Operation
- Repairs

Following is a detailed listing of the systems within Miami-Dade Transit that are inspected and maintained by the Track & Guideway Division:

Metrorail Mainline

22.9-mile double track, single line, electrically powered elevated rapid transit system

Track & Guideway responsible for:

- Maintenance and repair (Metrorail Track)
- Track and tie replacement
- Switch replacement
- Frog point maintenance
- Rail grinding
- Track fastener replacement

Structural Maintenance

Track & Guideway responsible for:

- Metrorail Guideway
- Metrorail Stations
- Metromover Stations
- Parking Garages
- Pedestrian Overpasses
- Metromover Guideway
- Equipment required for track and structural maintenance
- Preventive Maintenance
- Operation
- Repairs

Metrorail Stations

22 Stations stretching over 22 miles, from Dadeland through Hialeah to the Palmetto Expressway in Medley

Track & Guideway responsible for:

- Inspepction of the top of Metrorail Guideway
- Repair of Metrorail substructure and superstructure, stations, garages, and overpasses
- Cleaning acoustical barriers and station fascia panels

Metrorail
Parking Garages

Location	*Columns*	*Beams*	*Canopy Panels & Slabs (Sq Ft)*	*Stairway Structure Elements*	*Closure Fascia Panels*	*Seal Glands*
Dadeland South	40	10	350000	320' (4)	200	1400
Dadeland North	48	12	655,200	380' (4)	200	2,460
South Miami	98	10	373,800	400' (4)	200	1,398
Earlington Heights	52	19	208,800	504' (4)	240	3,280
Dr. Martin Luter King	78	19	84,720	302' (4)	320	1,156
Okeechobee	103	1,281	519,840	408' (6)	480	4,176

Metrorail Stations
Structural Inventory

Location	*Columns*	*Transverse Beams*	*Longitudinal Beams*	*Double T Girders*	*Canopy Panels & Slabs*	*Stairway Structure Elements*	*Closure Fascia Panels*	*Expansion Joints*	*Station Sq Ft*
Dadeland South	22	27	28	93	11	6	38	910	33,101
Dadeland North	78	38	38	123	4	4	186	910	43,646
South Miami	26	19	2	97	4	6	47	910	30,466
University	22	18	2	97		4	117	910	31,286
Douglas Road	68	42	48	116	4	4	88	910	37,603
Coconut Grove	22	30	28	88	2	4	117	910	31,286
Vizcaya	22	19	2	97	0	6	121	910	31,286
Brickell	74	36	46	109	6	5	56	910	43,430
Government Center	60	74	72	87	6	4	250	1,250	84,262
Overtown	22	1	32	97	4	4	86	910	32,161
Culmer	22	17	2	104	4	6	116	910	33,276
Civic Center	41	77	42	63	5	20	19	910	38,846
Santa Clara	42	45	37	66	4	16	22	910	37,304
Allapattah	22	19	2	97	4	6	141	910	32,121
Earlinton Heights	40	38	50	58	50	6	68	1,020	42,752
Brownsvil	36	48	48	70	88	16	12	910	37,304
Dr Martin Luther King		45	50	98	50	16	60	910	37,304
Northside	38	45	47	56	143	16	20	910	37,304
Tri-rail	98	17	51	52	106	28	88	910	30,666
Hialeah	22	27	30	94	13	6	117	910	31,286
Okeechobee	40	38	50	58	50	6	68	910	51,606
Palmetto	22	30	28	88	2	4	117	910	20,000
	839	750	735	1,908	560	193	1,954	20,470	828,296

Metrorail
Pedestrian Overpasses

Vizcaya Metrorail Station		Hialeah Metrorail Station		Douglas Road	
3205 S.W. 1st Avenue, Miami,		125 East 21st Street,		3100 Douglas Road, Miami,	
Station (sq ft)	7,565	Station (sq ft)	2,048	Station (sq ft)	1,400
Concrete Ramp (sq ft)	4,834	Concrete Stairways	2	Stairways	2
Parapet Walls (sq ft)	1,375	Landings (sq ft)	342	Stairway Landings	2
Girders	2	Girders	1	Concrete Deck (sq ft)	1,267
Concrete Deck (sq ft)	1,127	Concrete Deck (sq ft)	920	Caged Canopy (feet)	122
Columns	17			Canopy Supports	44
Archways	2			Parapet Walls	2

Metrorail Map

Metromover Guideway

4.59-mile elevated people mover system

Track & Guideway responsible for:

- All structural guideway supporting piers
- All steel girders
- Structural maintenance of 21 stations
- Station columns, platforms and canopies

Metromover Stations

21 Stations from Omni to Brickell

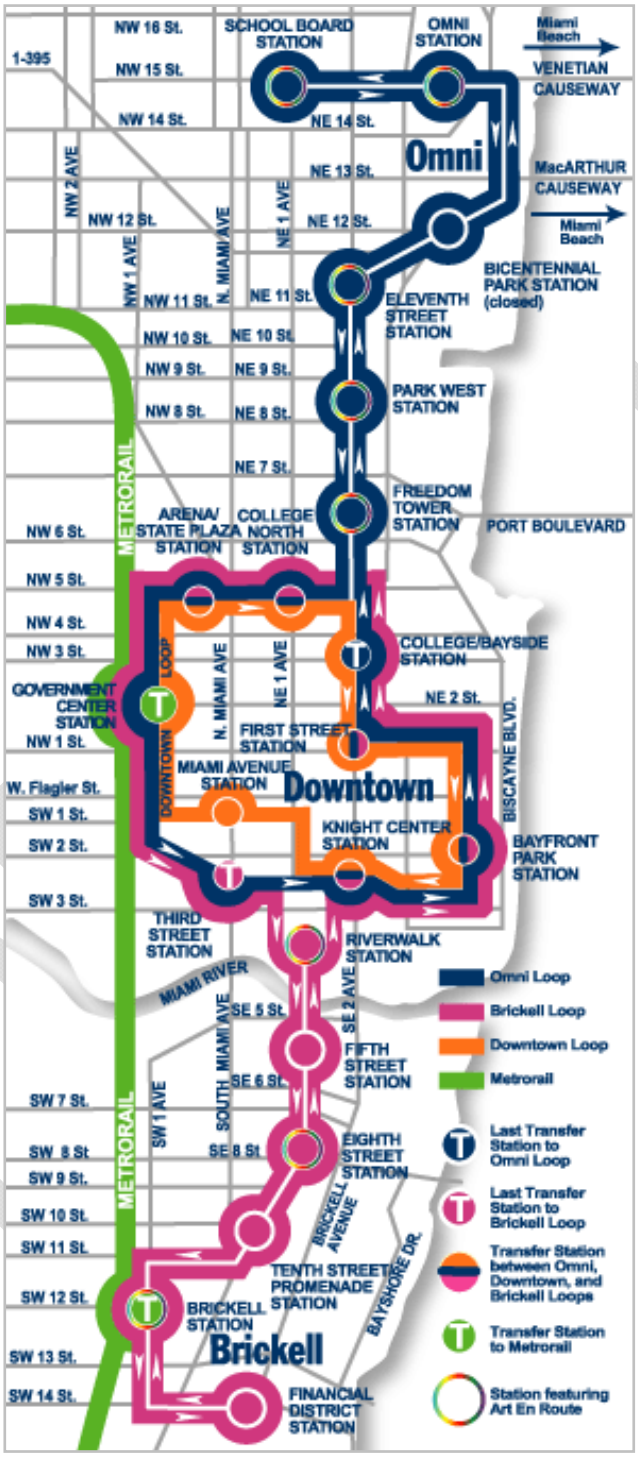
Track & Guideway responsible for:

- Structural maintenance of columns
- Structural maintenance of platforms
- Structural maintenance of concrete canopies

Metromover Stations Structural Inventory

	Columns	Platform Sq Ft	Canopy Sq Ft	Stairwells
Miami Avenue Station	4	5,973	7,168	2
Park West Station	4	15,950	19,140	2
Third Street Station	4	5,011	6,013	2
11th Street Station	4	19,810	23,772	2
Knight Center/World Trade Center	4	6,803	8,164	2
Bicentennial Park Station	4	15,615	18,738	2
Bayfront Park	4	25,744	30,890	2
Omni Station	4	9,351	11,221	2
First Street Station	4	4,879	5,855	2
School Board Station	4	3,159	3,791	2
College/Bayside	4	11,755	14,106	2
Riverwalk Station	4	7,056	8,467	2
College North	4	9,613	11,536	2
Fifth Street Station	4	7,056	8,467	2
Arena/State Plaza	4	11,524	13,829	2
Government Center Station	4	42,131	44,286	2
Eighth Street Station	4	4,606	5,527	2
Tenth Street Station	4	2,139	2,567	2
Financial District Station	4	2,498	2,998	2
Freedom Tower Station	4	14,030	16,836	2
Brickell Station	4	4,244	5,093	2

Metromover Map



The following table provides a summary view of Track & Guideway Division's physical inventory within Miami-Dade Transit:

Physical Inventory	*Metrorail Mainline*	*Yard*	*Metromover*	*Total*
Length in Miles				22.26
Elevated Guideway in Miles				20.96
Aerial Structure Inventory				
Girders				
Prestressed Double – T Girders	2,263			2,294
Prestressed Box Girders	6			6
Post-Tensioned Box Girders	377			377
Steel Box Girders	102			102
Total Girders	2,748			2,779
Columns	2,361			2,413
Pier Caps	481			481
Retaining Walls	13			13
Abutments	8			3,008
Concrete Decks	41			42
Elevated Stations	21			21
Drains				0
Column Drains	2,361			2,387
Seal Glands in Linear Feet	33,288			33,666
Metal Acoustical Barriers in Linear Feet	12,600			12,600
Track				
Ballasted Track in Linear Feet				
Track with Concrete Ties	14,054			14,054
Track with Wood Ties	2,136			2,136
Track @ Hi-Rail Access Crossing	189			189
Track @ Vehicle Maintenance Access Crossing	98			98
Track in Special Trackwork	1,504			1,504
Ballasted Track Total	17,981			17,981
Track with Direct Fixation Landis Fasteners	224,670			224,670
Track in Special Trackwork with Wood Ties in Concrete	3,896			3,896
Total Track in Linear Feet	246,547	39,470		286,017
Inventory				
Length in Miles				22.26
Rail				
Total Rail in Linear Feet	493,094	78,940		5,720,342
Cross Ties				
Ballasted Track (Each)				
Concrete	5,622	3,908		9,530
Wood	1,068	13,512		14,580
Special Trackwork	990			990
Total Ballasted Ties	7,680	17,420		25,100
Special Trackwork Wood in Concrete	2,550			2,550
Total Ties (Each)	10,230			27,650
Track Plates (Curves only – 25 Sections)				
Direct Fixation Landis Fasteners	179,736	288		180,024
Switches	52	59		111
Power Rail				
Third Rail in Linear Feet	246,260	35,792		282,052
Coverboard				
Third Rail Coverboard in Linear Feet	246,260	35,792		282,052
Hi-Rail Access Locations	3			3
Ballast in Tons (Required for Resurfacing)	51	3,384		3,435
Grade Crossings				
Concrete Grade Crossings		3		3
Flange Timber & Asphalt		18		18
Total Grade Crossings		21		21

Brian - will change this Table

Metrorail
Track Inventory

Mainline	*Quantity*	*System Miles*	*Total Track Miles*
Revenue Tracks	2	23	45.30
Pocket Tracks	3	1	0.95
Crossovers	14	1	0.71
Junctions	1	0	0.06
Yard leads	2	1	1.22
Storage Tracks	4	0	0.64
Total	26	25	48.88

Palmetto Yard	**Quantity**	**Track Feet**	**Track Miles**
Running Tracks	3	11,461	2.17
Storage Tracks	12	10,981	2.08
Vehicle Maintenance Tracks	9	10,293	1.95
Maintenance of Way Tracks	8	5,918	1.11
Crossovers 12#8	6	1,140	0.22
Turnouts #6	51	3,570	0.68
Total	89	43,363	8.21

New Table will include:

1-Mainline
2-Tail Track
3-Yard

Metrorail
Track Inventory - Type

	Quantity	*Mainline Feet*	*Yard Feet*	*Total*
Ballasted Track Concrete Tie		19,372	13,087	32,459
Ballasted Track Wood Tie		2,136	21,087	23,223
Hi-rail Access Crossings Concrete Panel	8	256		256
Vehicle Maintenance Access Crossing	(6) (7)	98	112	210
Road Crossings Concrete Panel	3		152	152
Road Crossings Rubber Flange	36		580	580
Speacial Track Work Wood Tie	(10) (63)	1,504	4,710	6,214
Special Trackwork Concrete Tie	4	492		492
Shop Track in Concrete	10		3,275	3,275
Ballasted Track Total		23,858	43,003	66,861
Direct Fixation L.B. Foster Fasteners	6,296	7,870		7,870
Direct Fixation Landis Fasteners	177,694	22,108	360	222,468
Special Trackwork Direct Fixation	184	406		406
Special Trackwork Wood Tie in Concrete	32,513	3,896		3,896
Direct Fixation Track Total		234,280	360	23,640
Track Feet Total		25,138	43,363	301,501

Metrorail
Track Components

	Quantity	**Mainline Feet**	**Yard Feet**	**Total**
Rail in Linear Feet Total		516,276	86,726	603,002
Cross Ties Wood in Ballast		1,068	10,241	11,309
Cross Ties Concrete in Ballast		7,749	5,235	12,984
Special Trackwork Wood Ties in Ballast		990	3,156	4,146
Special Trackwork Concrete Ties in Ballast		324		324
Ties in Ballast Total		10,131	18,632	28,763
Special Trackwork Wood Ties in Concrete		2,550		2,550
Total Ties (each)		12,681	18,632	31,313
Direct Fixation Landis Fasteners		177,694	288	17,982
Direct Fixation L.B. Foster Fasteners		6,296		6,296
Special Trackwork L.B. Foster Fasteners		528		528
Total Fasteners (each)	184,518	288		184,806

Metrorail
Track Components

	Quantity	*Mainline Feet*	*Yard Feet*	*Total*	
Rail in Linear Feet Total		516,276	86,726	603,002	
Cross Ties Wood in Ballast		1,068	10,241	11,309	
Cross Ties Concrete in Ballast		7,749	5,235	12,984	
Special Trackwork Wood Ties in Ballast		990	3,156	4,146	
Special Trackwork Concrete Ties in Ballast		324		324	
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Special Trackwork Wood Ties in Concrete		2,550		2,550	
Total Ties (each)		12,681	18,632	31,313	
Direct Fixation Landis Fasteners		177,694	288	17,982	
Direct Fixation L.B. Foster Fasteners		6,296		6,296	
Special Trackwork L.B. Foster Fasteners		528		528	
Total Fasteners (each)	184,518	288		184,806	
Ballasted Curves Total Feet	(19) (41)	7,405	9,738.00	17,143.00	
Direct Fixation Curves Total Feet	-107	70,644		70,644.00	
Total Curves in Feet	78,049	9,738	87,787.00	175,574.00	
Grade & Access Crossing Concrete Panel		8	3.00	11.00	
Grade Crossing Rubber Flange Asphalt			36.00	36.00	
Total Grade Crossings (each)		8	39.00	36.00	
Emergency Guard Rail					
Double Rail Direct Fixation	2	7,130		7,130.00	
Single Rail Direct Fixation	4	2,000		2,000.00	
Single Rail Wood Tie	4	1,762		1,762.00	
Single Rail Concrete Tie	2	500		500.00	
Emergency Guard Rail Total Feet		11,393		11,393.00	
Bumping Post Standard		3	2.00	5.00	
Bumping Post Friction		2		2.00	
Total Bumping Posts (each)		5	2.00	7.00	
Power Rail:					
Total Third Rail in Feet		257,751	35,752.00	293,503.00	
Cover Board:					
Total Top Cover Board in Feet		257,751	35,752.00	295,503.00	
Total Side Cover Board in Feet		54,560	35,752.00	90,312.00	
Third Rail Assemblies:					
Total End Approaches (each)		270	217.00	487.00	
Total Expansion Joints (each)		216	1.00	217.00	
Total Anchors (each)		577	110.00	687.00	
Total Dip Rails (each)		28	8.00	36.00	
Special Trackwork:					
Main Line - No. & Type Turnouts:		#10	#5	#6 Diamond Type	
Three Pocket Tracks (35 10")	18	12	6.00	NA	
Three Double Crossovers (14')	12	12		3-#1	
Two Double Crossovers (15')	8	8		2-#2	
Two Double Crossovers (35 10")	8	8		2-#3	
One Line Junction (Varies)	2			Movable Points	
One Tail Track (35'10")	3	2		1.00	NA
Palmetto Yard - No. & Type:					
6 each single crossovers (Varies)	12		12.00		
51 Each Turnouts	51			51.00	
Total	114	42	12.00	52.00	8.00

Property Value

In February 2004, the Miami-Dade County Risk Management provided the Track & Guideway Division with property insurance schedules, which totaled over $271 million for the Metrorail guideway and $119 million for the Metromover guideway. **Bill & Lee – add references and descriptions for Shop (Stockroom $35,000 + Equipment value + Nonstoreroom inventory = $1.2 million**

Contract Services

At the present time, contractual services include:

1 - Blanket Repairs for equipment + estimated value of PO - Bryan and Lee

2 - Service Contracts designed to maintain and inspect track, rail grinding, Sperry – list vendors, contract requirements, and contract value - Bryan

Organization

Track & Guideway Division operates 24 hours a day, 7 days a week under the direction of the Rail Track & Guideway General Superintendent, who reports to the Assistant Director, Rail Services. Maintenance of MDT track and guideway is accomplished by a total of 136 Track & Guideway staff.

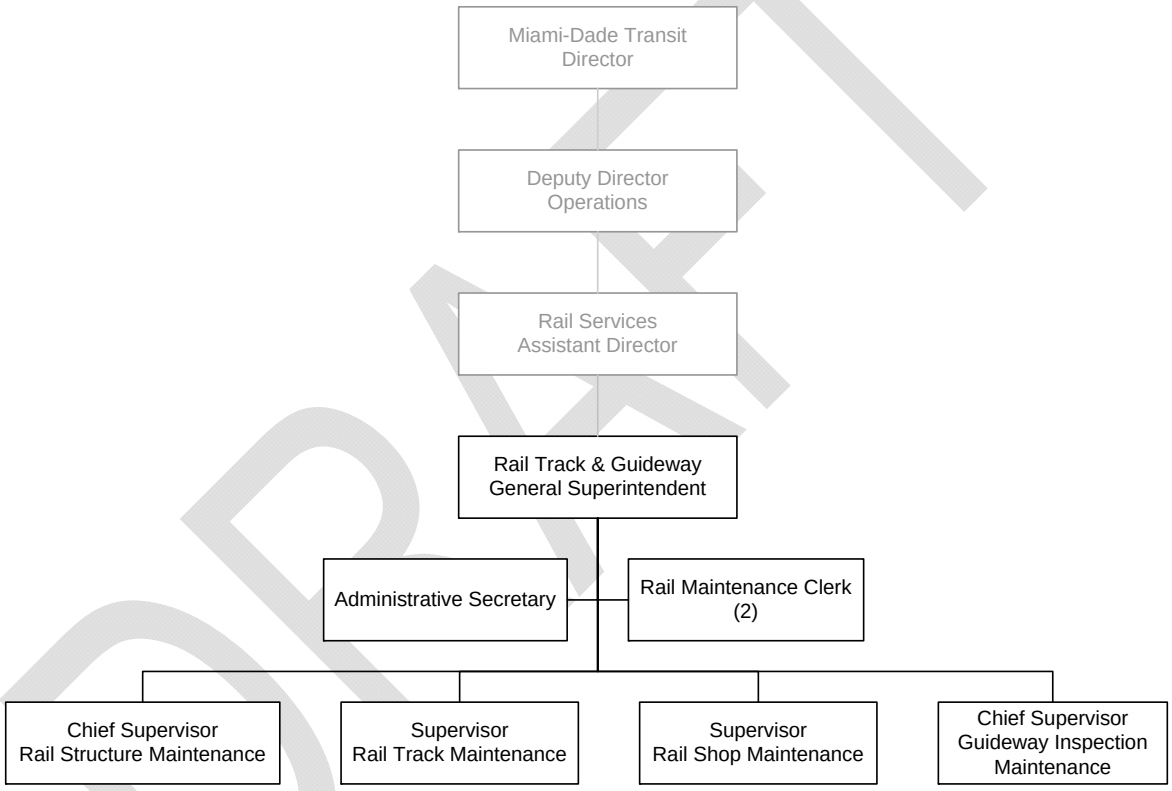
Rail Track & Guideway General Superintendent

The Rail Track & Guideway General Superintendent supervises and directs the maintenance of fixed guideway rail transit systems, including Metrorail tracks and Metrorail and Metromover guideway, station structures, parking garages and pedestrian overpasses, including equipment used in track and guideway maintenance functions. The General Superintendent's primary responsibilities include:

- Plans, develops and directs the implementation of all Metrorail tracks and Metrorail and Metromover guideway, station structures, parking garages and pedestrian overpass activities
- Plans, coordinates and directs, through various levels of subordinate chief supervisors, the activities of technical employees responsible for periodic inspections, repairs, retrofits and testing of track & guideway systems and station structures
- Participates in the development of technical specifications and plans for acquisition of necessary equipment and machinery, and programs for the repair and rehabilitation of existing equipment and facilities
- Develops and prepares recommendations for annual budget; authorizes the purchase of supplies, tools and machinery
- Identifies Capital improvements and pursues funding
- Plans, develops, implements and maintains routine and preventive maintenance programs for efficient and effective inspection
- Reviews Disciplinary Action Reports and labor grievances and chairs various committees
- Informs and advises the Assistant Director of personnel, equipment, track or structural related problems and recommends solutions
- Enforces established safety practices and procedures
- Coordinates activities with other departmental entities

Reporting directly to the Rail Track & Guideway General Superintendent are an Administrative Secretary, who performs a variety of complex secretarial and clerical duties, two Rail Maintenance Clerks, who perform specialized clerical work processing and maintaining rail maintenance records, and four Chief Supervisors.

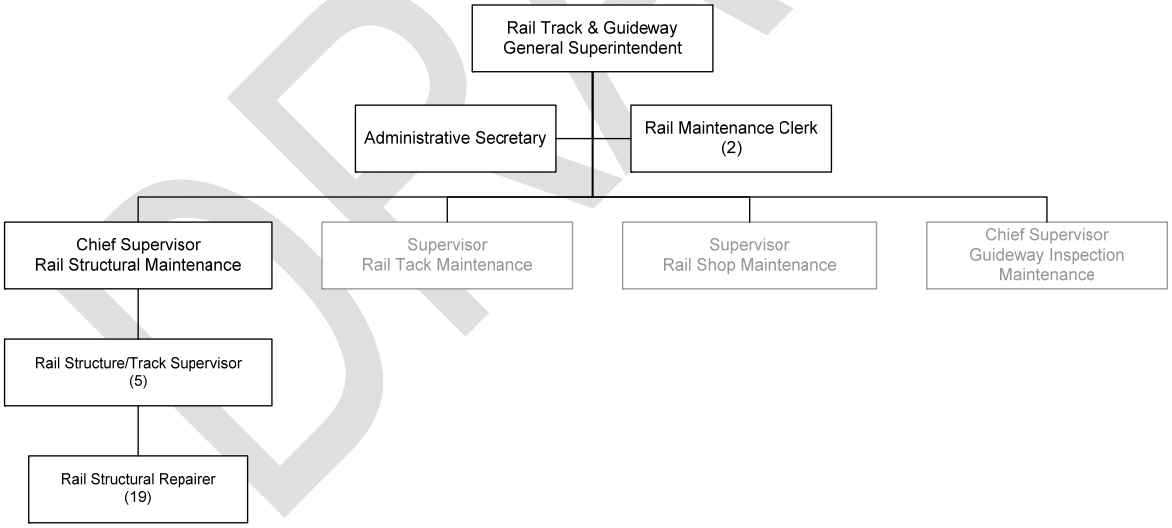
- One (1) Chief Supervisor, Rail Structural Maintenance
- One (1) Supervisor, Rail Track Maintenance
- One (1) Chief Supervisor, Guideway Inspection Maintenance
- One (1) Supervisor, Rail Shop Maintenance



Rail Structure Maintenance

The Chief Supervisor of Rail Structure Maintenance is responsible for the inspection of the top of the Metrorail girders under traffic, maintenance efforts for Metrorail and Metromover structures, which total over 27 miles, as well as maintenance of acoustical barrier panels, drainage, and pier cleaning. Primary responsibilities of the Chief Supervisor of Rail Structure Maintenance include:

- Manages, through subordinate supervisors, a staff of equipment operators, technicians and semi-skilled employees in the repair and maintenance of rail structures and track and guideway systems
- Manages the inspection of the top of the guideway under traffic conditions,
- to ascertain problems and ensure that the structures are safe and operational
- Establishes repair and maintenance priorities
- Investigates structural conditions and determines necessary repairs
- Participates in the development of budget forecasts, staff estimates and need for new equipment
- Establishes and enforces safety rules and procedures
- Assists in the development and implementation of training programs that pertain to structural maintenance and repair
- Reviews repair procedures and supervises the implementation of procedures for correcting conditions in emergency circumstances
- Participates in structural repairs or rehabilitation projects to be accepted from contractors
- Employees who report directly to the Chief Supervisor of Rail Structural Maintenance include:



- Five (5) Rail Structure/Track Supervisors, who direct the activities of nineteen (19) Rail Structural Repairers in the inspection, repair and maintenance of rail structures and track and guideway systems.

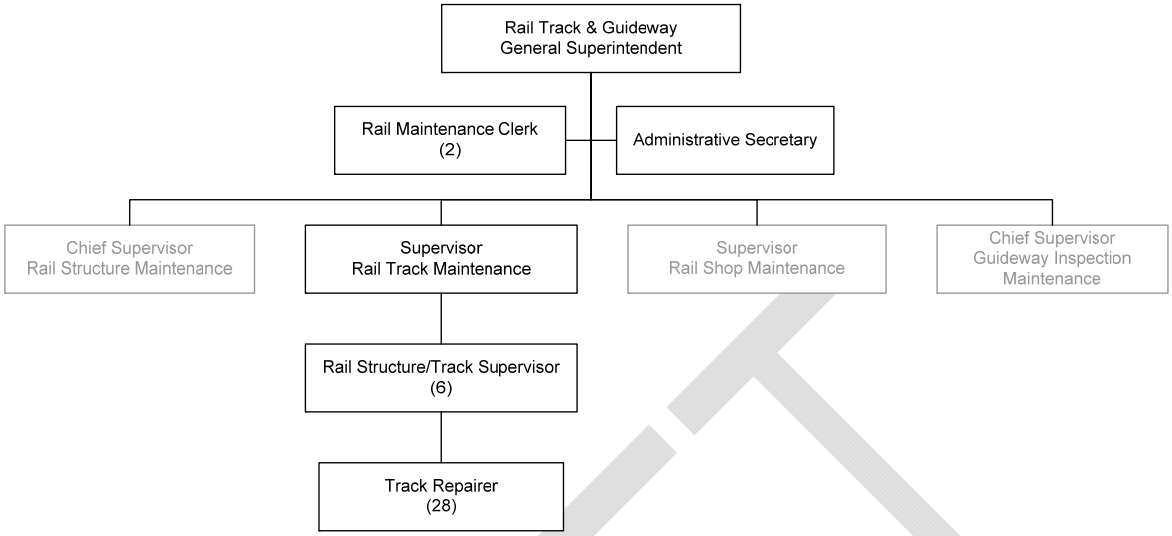
- Nineteen (19) Rail Structural Repairers perform skilled tasks in the repair and maintenance of rail related structures, including stations, piers, girders, parking garages and pedestrian overpasses. Duties include repairing concrete, refinishing surfaces, welding, strengthening weakened sections, painting aerial structures, and operating a variety of power tools. Rail Structural Repairers exercise some independent judgment in the various technical phases of repair, inspection, and maintenance of rail structures. Rail Structure and Track Supervisors provide supervision and review work in progress and upon completion for satisfactory repair and maintenance of rail structures.

Rail Track Maintenance

The Supervisor of Rail Track Maintenance is responsible for the repair and maintenance of track and various guideway systems in a rail transportation system. The following are primary responsibilities of the Supervisor of Rail Track Maintenance:

- Manages, through subordinate supervisors, the work of track repairers, equipment operators and semi-skilled employees engaged in the inspection, repair and maintenance of track systems including power rail
- Determines track repair and maintenance priorities
- Develops and initiates track maintenance plans, programs and procedures
- Assists in the development and implementation of training programs that pertain to track maintenance and repair
- Participates in the development of budget forecasts, staff estimates and need for new equipment
- Inspects or supervises the inspection of tracks, third rail systems and all appurtenances, guideway and adjacent areas to determine their safe and operational condition
- Enforces established safety practices and procedures
- Monitors work in progress and upon completion
- Coordinates track repair and maintenance activities with other rail operations

Employees who report directly to the Supervisor of Rail Track Maintenance include:



- Six (6) Rail Structure/Track Supervisors, who direct the activities of twenty-eight (28) Track Repairers in the performance of a variety of track maintenance and repair tasks in a public transportation system

    - Twenty-eight (28) Track Repairers perform semi-skilled tasks in the repair, maintenance and construction of trackwork. Duties include operating hand tools and machinery related to track repair work, removing and replacing track plates and ties, and assisting with the placement of rails. Track Repairers exercise some independent judgment in the performance of routine work. Rail Structure/Track Supervisors provide supervision of more difficult work and review work in progress and upon completion for satisfactory performance of assigned duties and tasks

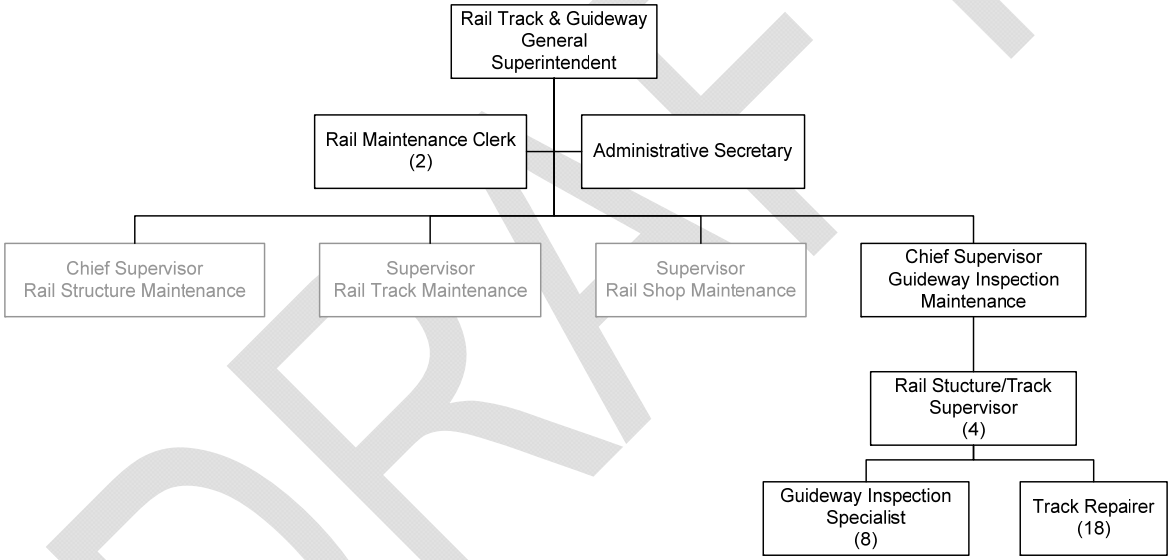
Guideway Inspection Maintenance

The Chief Supervisor of Guideway Inspection Maintenance is responsible for the inspection of track and various guideway systems in a rail transportation system. The following are primary responsibilities of the Chief Supervisor of Rail Inspection Maintenance:

- Manages the inspection of Guideway Inspection Specialists engaged in the inspection of the track and various guideway systems including power rail
- Determines track repair and maintenance priorities
- Develops and initiates track inspection plans, programs and procedures

- Assists in the development and implementation of training programs that pertain to track inspection.
- Participates in the development of budget forecasts, staff estimates and need for new equipment
- Inspects or supervises the inspection of tracks, third rail systems and all appurtenances, guideway and adjacent areas to determine their safe and operational condition
- Enforces established safety practices and procedures
- Monitors work in progress and upon completion
- Coordinates track inspection activities with other rail operations

Employees who report directly to the Chief Supervisor of Guideway Inspection Maintenance include:



- Four (4) Rail Structure/Track Supervisors, who direct the activities of eight (8) Guideway Inspection Specialists and eighteen (18) Track Repairers in the performance **Need description of duties**

    - Eight (8) Guideway Inspection Specialists perform a variety of track inspections Duties include walking tracks, performing track inspection tasks, making emergency repairs and observing safety rules and regulations. Employees perform duties while exposed to various weather conditions and under traffic conditions, which are generally considered dangerous. Work requires considerable physical effort and stamina. The **Identify specific supervisor**

provides supervision and reviews work for thoroughness of inspection and repair tasks, and for observance of established safety practices and procedures **Verify and update this description**

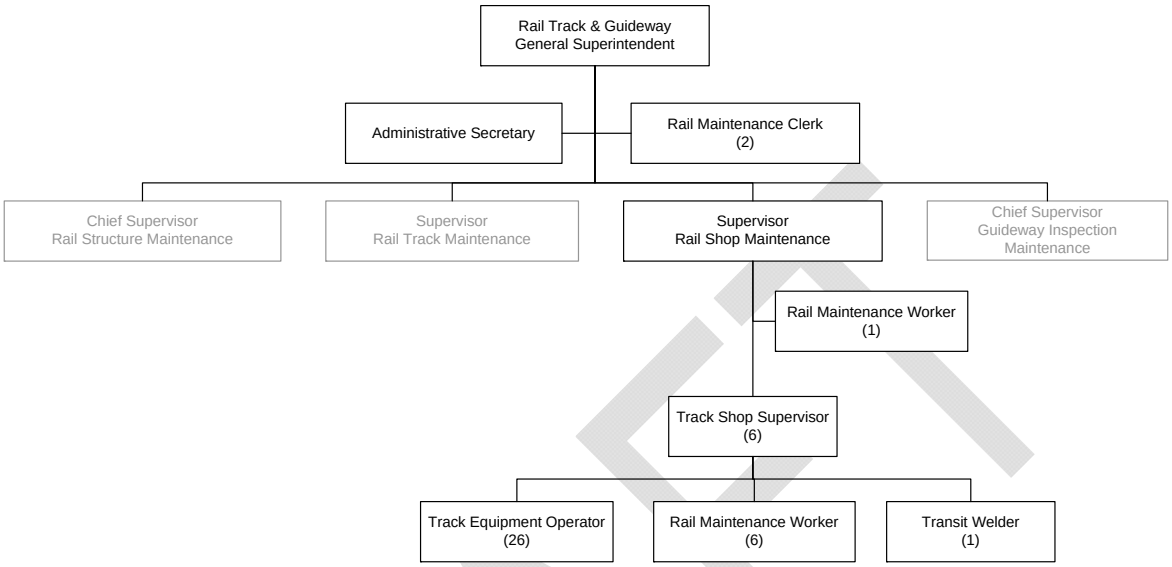
- Eighteen (18) Track Repairers perform semi-skilled tasks in the repair, maintenance and construction of trackwork. Duties include operating hand tools and machinery related to track repair work, removing and replacing track plates and ties, and assisting with the placement of rails. Track Repairers exercise some independent judgment in the performance of routine work. Rail Structure/Track Supervisors provide supervision of more difficult work and review work in progress and upon completion for satisfactory performance of assigned duties and tasks

Rail Shop Maintenance

The Supervisor of Rail Shop Maintenance is responsible for the technical and administrative supervision, planning and coordinating of the repair, operation and maintenance of track and guideway equipment. Primary responsibilities of the Supervisor of Rail Shop Maintenance include:

- Supervises, through subordinate supervisors, the operations of a rail shop
- Supervises the repair and maintenance of track and guideway equipment
- Supervises the safe operation of rail shop equipment
- Inspects completed work and ensure proper operations
- Establishes repair and maintenance priorities and programs
- Periodically inspects rail shop facilities to ensure proper repair activities
- Coordinate track and guideway equipment repair and maintenance work with other rail officials
- Enforces safety practices and procedures
- Participates in the development of budget forecasts, staff estimates and need for new equipment
- Assists in the development and implementation of training programs that pertain to equipment maintenance and repair
- Ensures work orders are prepared on a timely basis, maintenance records are complete and accurate, and work orders for preventive maintenance are generated at the proper time
- Participates in the inspection of track facilities to be accepted from contractors

Employees who report directly to the Supervisor of Rail Shop Maintenance include:



- Six (6) Track Shop Supervisors who direct the activities of twenty-six (26) Track Equipment Operators, six (6) Rail Maintenance Workers, and one (1) Transit Welder. Track Shop Supervisors are responsible for supervising technical and semi-skilled employees engaged in the repair and maintenance of track and guideway equipment and in the operation of track shop equipment.

    - Twenty-six (26) Track Equipment Operators who perform skilled work in the operation and maintenance of track and related support equipment. Duties include operating a high-rail crane, boom trucks, bucket trucks, aerial platforms, utility vehicles, and other hi-rail equipment. Related tasks include performing minor maintenance on equipment as well as occasionally performing major maintenance, repair and overhaul work. Employees exercise a considerable degree of manipulative skill and dexterity in the operation of heavy equipment and caution in safeguarding persons and property during equipment operation. Track Shop Supervisors provide supervision and review work in progress and upon completion for effective equipment operation, proper repair and maintenance work, and adherence to established safety procedures.

- One (1) Rail Maintenance Workers, who reports directly to the Supervisor of Rail Shop Maintenance _____ **Describe duties**

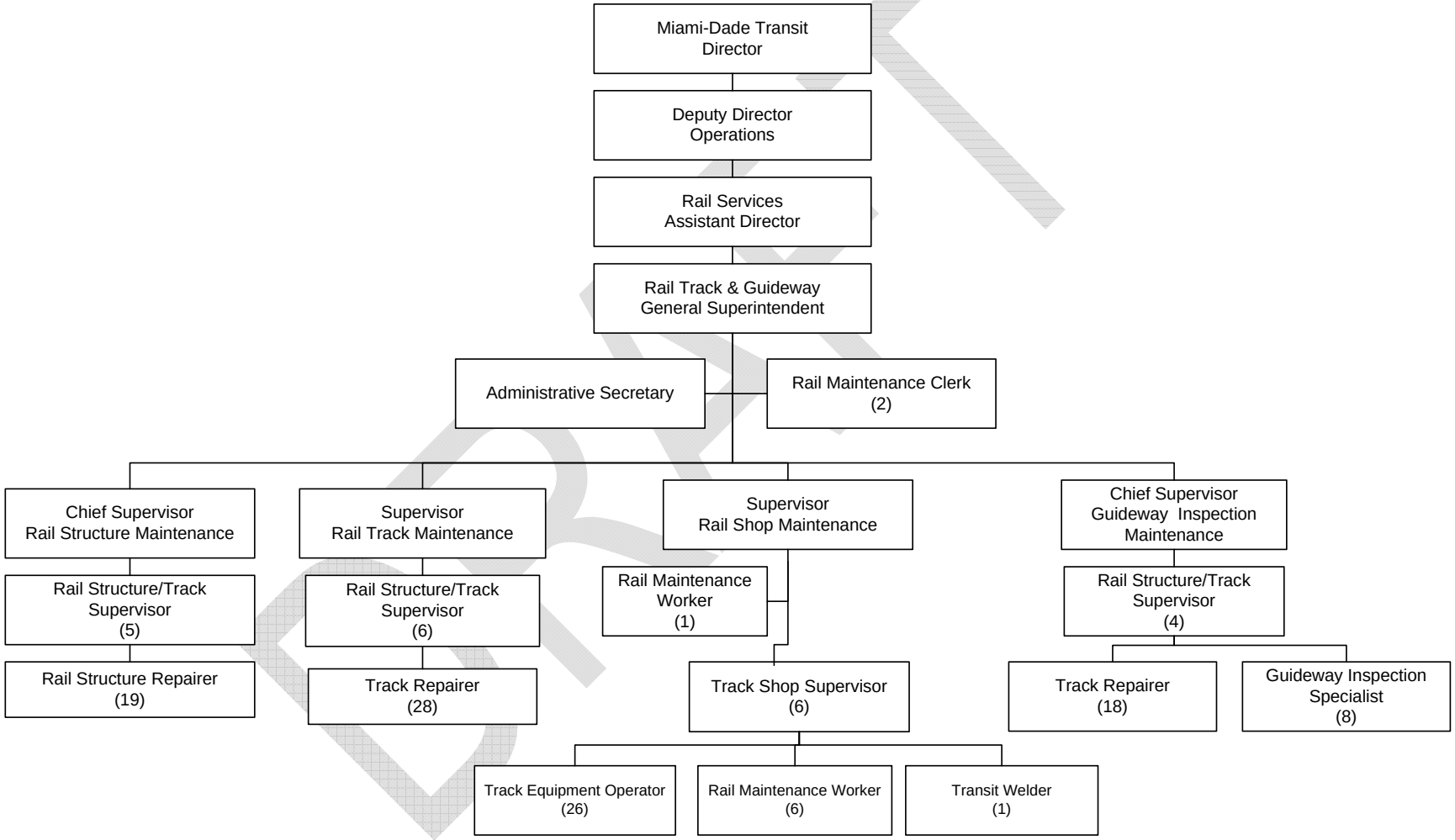
- Six (6) Rail Maintenance Workers who perform laboring tasks requiring some acquired skills in the use of air tools, hydraulic tools, gasoline-powered tools and other construction and maintenance related equipment. Duties may include general maintenance work on tracks, structures and in the right-of-way, cleaning functions, and assisting in the installation and repair of equipment. Rail Maintenance Workers perform routine tasks with some independence. Track Shop Supervisors provide supervision of more difficult work and review work in progress and upon completion for satisfactory performance of assigned tasks and duties.

- One (1) Transit Welder who possesses three years of experience in MIG, TIG, gas, electric and heliarc welding in the horizontal, vertical, overhead and flat positions, including layout and fabrication or two years of experience in gas, electric and heliarc welding in the horizontal, vertical, overhead and flat positions including layout and fabrication. The Transit Welder must possess a certificate issued by affiliates of and/or by the American Welding Society (AWS) in flat, vertical, horizontal and overhead welding (6G), a Commercial Driver License/Class B, and power tools.

There is another position referred to as the Track and Guideway Instructor – don't have a clue as to duties or reporting relationship.

The Track & Guideway Division Table of Organization is located on the following page.

Track & Guideway Division Table of Organization



Following is a summary of personnel assigned to the Track & Guideway Division:

Track & Guideway Personnel

General Superintendent Rail Track/Guideway	1
Chief Supervisor, Rail Structure Maintenance	1
Chief Supervisor, Guideway Inspection Maintenance	1
Supervisor, Rail Track Maintenance	1
Supervisor, Rail Shop Maintenance	1
Track Shop Supervisor	6
Rail Structure/Track Supervisor	15
Rail Maintenance Clerk	2
Track Equipment Operator	26
Rail Structure Repairer	19
Track Repairer	46
Rail Maintenance Worker	7
Guideway Inspection Specialist	8
Transit Welder	1
Administrative Secretary	1
Track & Guideway Instructor	1
	137

II. Current Operating Practices

Track & Guideway Maintenance Program

The philosophy and goals of the Track & Guideway Division Maintenance Program Policy are to ensure that the tracks and supporting structure are safe and sound for passenger service. This is accomplished through daily track inspections and responding to all structural conditions reported through the bridge inspection program. Cleaning of the guideway is also an important component of the Maintenance Program. Above all, safety is a primary concern as employees in this division work at heights, near an energized power rail and transit cars passing by. Quality assurance, which is the responsibility of the chief supervisors, is an important part of the Maintenance Program. The Maintenance plan also strives to maximize cost effectiveness of maintenance efforts consistent with safe operations through a proper balance of preventive maintenance, corrective maintenance, and systems improvements, where necessary.

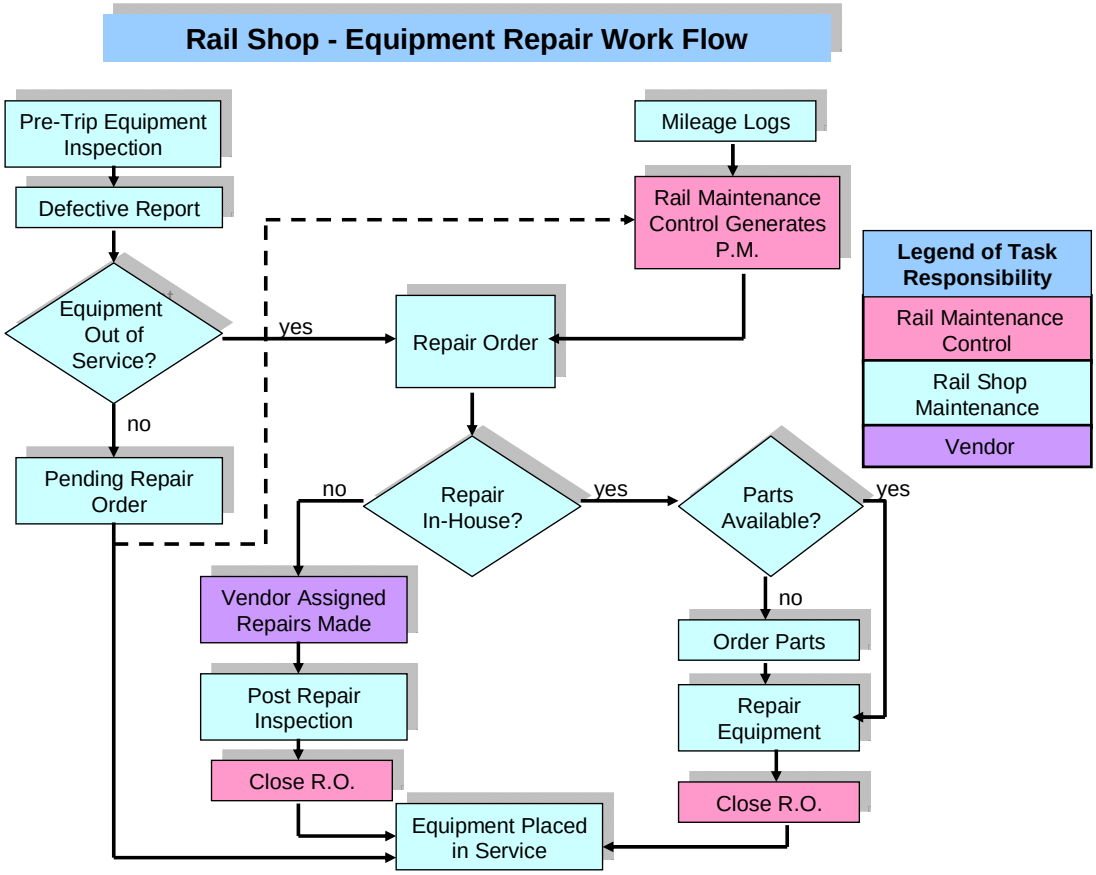
Preventive Maintenance

Rail Shop

The Rail Shop **conducts– rewrite to reflect current planning with Rail Maintenance Control to establish a procedure to schedule and track preventive maintenance (PM)** on equipment based on the manufacturer's recommendations and time intervals.

Rail Shop Maintenance is predicated on preventive maintenance procedures and frequencies established by the manufacturer. Rail Maintenance Control provides the necessary documentation to track PMs and ensures a timely schedule. Rail Shop Maintenance forwards completed inspection reports to Rail Maintenance Control. Repairs are recorded and forwarded to Rail Maintenance Control via Wayside Malfunction Reports. **Bill – verify that graphic is correct + expand discussion of process based on the graphic + reference graphic in discussion**

DRAFT



Primary locations, inventoried equipment, and projected man hours to facilitate preventive maintenance identified within the equipment inventory include the following:

Area	*Inventoried Equipment*	*Projected Manhours*
Remedial Action Reports Metrorail and Metromover	5,109	15,540
Acoustical Barriers	20,600	7,770
Guideway Seal Gland Replacement	33,288	7,770
Metrorail Station Structural Repairs	to be determined	7,770
Metrorail Parking Garage Repairs	to be determined	7,770
Metrorail Pedestrian Overpasses	to be determined	Note[1]
Top of Guideway Inspection	2,748	1,234
Metromover Girders	666	Note[2]
Metromover Piers	435	Note[2]
Metromover Stations	21	Note[3]
Total		47,854

[1] *The same crew maintains parking garages and overpasses.*

[2] *Remedial Action Reports include Metrorail and Metromover guideways, including girders and piers.*

[3] *Labor hours based on unofficial inspections; parking garages and overpasses not yet inspected.*

Bill – update this section with data and more detail A total of ___ individual PMs were developed; _____ **(Description of Inventory)**_____. A Track & Guideway Division Master PM Listing is included in **Appendix F**.

Rail Track Inspection and Maintenance

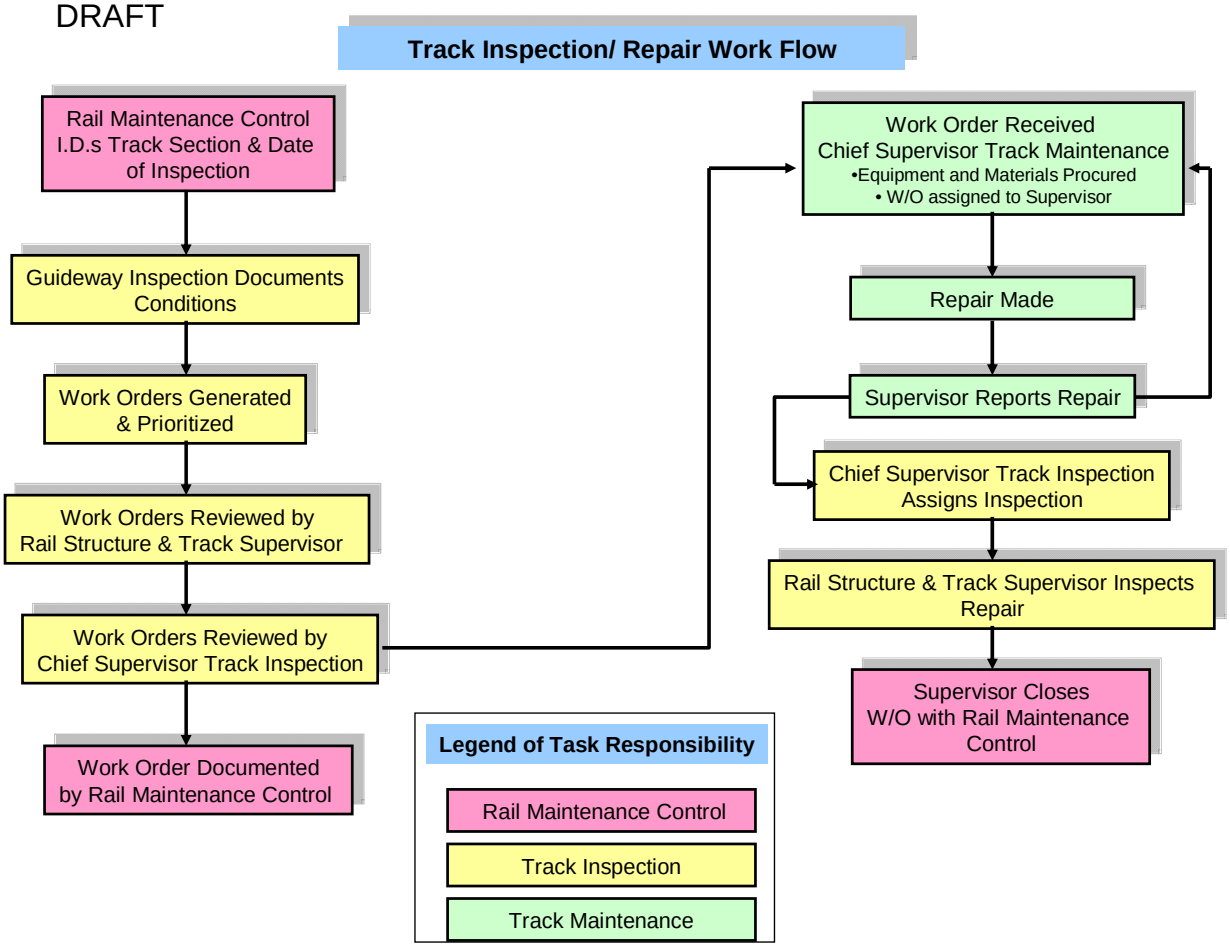
Track preventive maintenance performed by Rail Track Maintenance personnel is based on _____**Bryan - expand and verify**_____ (A.R.E.A.)[1] and _____**Bryan – expand and verify**_____ (F.R.A.)[2] standards.

Rail Track Maintenance performs maintenance on a schedule developed and tracked by Rail Maintenance Control. Repairs are carried out according to daily inspection reports and established track standards. **Bryan – revise graphic + expand discussion of process (including more detail on the actual inspection process) based on graphic + reference graphic in discussion**

1

2

DRAFT

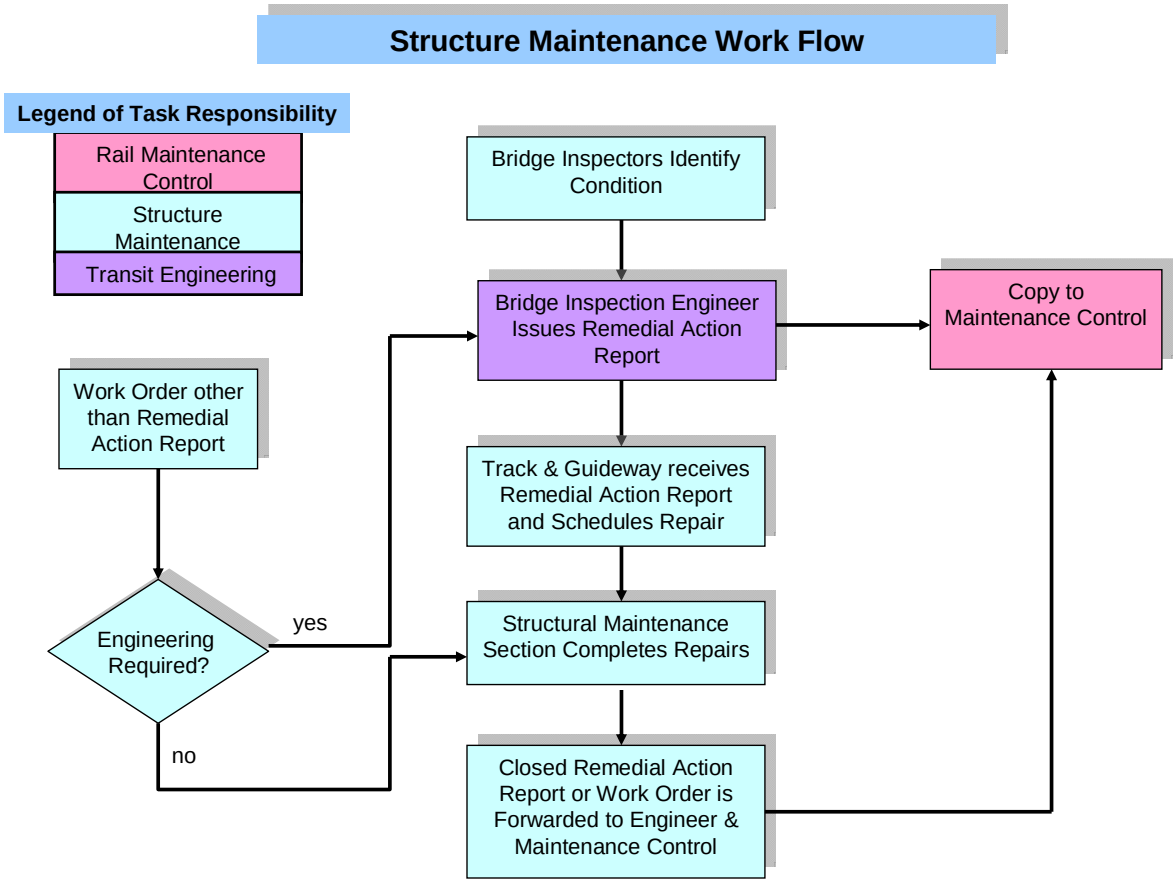


Rail Structure Maintenance

Rail Structure Maintenance conducts inspections and performs preventive maintenance repairs based on the State of Florida Bridge Inspection Program.

Rail Structure Maintenance performs repairs based on Remedial Action Reports (RAR) that are issued by Transit Engineering and are classified by **priority** ranking**.** Rail Maintenance Control receives the Remedial Action Report, date-stamps the RAR, and forwards it to the Track and Guideway Division. Remedial Action Reports are similar to a work or repair order. RARs identify the type of repair that is needed, the repair procedure as well as the priority of the repair. Most Remedial Action Reports are "priority 3," which means that the repair is recommended to insure the long-term durability of the structure. These repairs are in the "maintenance" category according to the Florida Department of

Transportation. RARs are based on information acquired through the ongoing Bridge Inspection Program. Quality Control is maintained by the Engineer of the Bridge Inspection Program, the Track and Structure Supervisor, and through continual repetitive comprehensive inspections, which verify the repair and status. Upon completion of the repairs, the RARs are closed. The closed RAR is returned to Transit Engineering and Rail Maintenance Control, as illustrated below.



Remedial Action Reports are the primary focus of the Structure Maintenance Section. For Metrorail, the Bridge Inspection Program typically prepares Remedial Action Reports, which contain between 3,000 and 4,000 repairs. Many conditions that were previously in a "monitor category" develop into a "repair category."

Metromover generates approximately 1,500 repairs that are mostly paint coating repairs. In addition to Metrorail and Metromover maintenance, Structure

Maintenance will soon begin structural repairs of the Metrorail and Metromover stations, Metrorail parking garages, and Metrorail overpasses.

Occasionally, conditions arise or suddenly develop that are not included in the Remedial Action Report process. In these instances, the Engineer is consulted and, as a result, develops a specific repair procedure, including drawings. Depending on the severity, these repairs are generally corrected immediately. There are times when these conditions do not require engineering assistance. In these instances, the repairs are completed in accordance with established procedures.

Corrective Maintenance

When maintenance repairs are required as a result of failures, it is difficult to compensate for the absence of the equipment. Service quality suffers, and the cost of repairing the failed equipment can be more expensive than the planned repairs.

Rail Structural Maintenance and Rail Tack Maintenance perform corrective maintenance in response to information provided through comprehensive inspection programs:

- Track Visual Inspection – track is visually inspected once each week
- Geometry Inspection – performed four (4) times per year through a contract service
- Ultrasonic Testing – performed two (2) times each year

Bryan – complete process flow diagram for corrective maintenance that addresses all of the above + provide a detailed description of the process

The corrective maintenance program within Rail Shop Maintenance consists of two (2) types:

- Minor Repairs – performed by in-house forces
- Major Repairs – contracted to authorized factory representatives

Bill – complete process flow diagram for corrective maintenance that addresses includes minor and major repairs + provide a detailed description of those processes

Quality Control

Quality control is performed by supervisors external to direct performance of the maintenance or repair. In addition to a first line supervisor, each section has a Chief Supervisor who, among other duties, performs **quality assurance duties**. Quality control is also assured by recurring inspections. **Lee – outline the quality assurance duties + describe the process + develop process flow chart + give history of results of quality assurance activities to date**

Overhaul and Rebuild

This function is contracted out, with the exception of special rail equipment, which is not serviceable by local vendors.

III. Demand

the purpose of this section is to show how many man-hours are needed within each area to perform PM and corrective maintenance

Track and Guideway

Track & Guideway Chief Supervisors and staff established an inventory of existing equipment based on a detailed review of all equipment located throughout the Metrorail and Metromover structures and stations, Metrorail track and Track and Guideway equipment. **The inventory and corresponding preventive maintenance assignments were developed in conjunction with Rail Maintenance Control and correspond to the man hour requirements established in the Track & Guideway Master Preventive Maintenance List (Appendix _). Areas included in the inventory are as follows**

Bud, Bryan, and Bill – update table

Areas Requiring Preventive Maintenance	*Type of PM*
Track	
Metrorail Structure	
Metromover Structure	
Metrorail Structural Maintenance of Stations	
Metromover Structural Maintenance of Stations	
Metrorail Parking Garages and Pedestrian Overpasses	
Equipment for Track and Structural Maintenance	Mile and/or Hour

Inventory by Type and Service Life

Rail Shop

Staff conducted a thorough analysis of the shop inventory to determine the type of preventive maintenance needed and the scope of maintenance requirements. A total of 255 preventive maintenance inspections were identified.

Shop Equipment

Type of PM	# *Inspections*	*%/Total*
A-2,000-Mile	3	1.2%
A-250-Hour	69	27.1%
B-4,000-Mile	3	1.2%
B-500-Hour	69	27.1%
C-2,000-Hour	31	12.2%
C-24,000-Mile	2	0.8%
C-Annual	4	1.6%
Monthly	74	29.0%
Total	255	

When equipment requires multiple PM schedules, e.g., monthly inspections in addition to an annual inspection, the annual inspection actually replaces one of the monthly inspections. For that equipment, staff would conduct only 11 of the 12 monthly inspections plus one annual inspection. A review of the actual inspection schedule showed that each piece of shop equipment requires multiple PMs.

While the majority of equipment is maintained by track & guideway staff, some specialized equipment requires the use of certified contract personnel for completion of preventive maintenance activities. **Bill – update information throughout this section** The Track & Guideway Division identified ___ pieces of equipment that are maintained solely by a contractor (___%) and ____ pieces of equipment serviced by track & guideway staff in addition to a contractor (___%).

Shop Equipment

Type of PM	*# Manhours*	*%/Total*
A-2,000-Mile	24	0.7%
A-250-Hour	737	20.9%
B-4,000-Mile	20	0.6%
B-500-Hour	592	16.8%
C-2,000-Hour	367	10.4%
C-24,000-Mile	28	0.8%
C-Annual	38	1.1%
Monthly	1,721	48.8%
Total	3,527	

Staff determined that the current inventory includes a total of 255 individual pieces of equipment that require 3,527 man-hours of maintenance on the part of Track & Guideway staff annually. Monthly inspections account for almost half of all inspection man-hours, followed by the A-250 Hour and B-500 Hour inspections.

Most of the equipment maintained by track & guideway staff has a service life that ranges from __ to __ years (_____%), with over half of the equipment in the ___-___ year range (____%). Regular preventive maintenance on this type of low turnover equipment is critical in order to maintain acceptable operation over many years.

Rail Track Inspection and Maintenance

Bryan – identify PM activities required for track along with man-hour requirements (use shop equipment analysis as an example)

Rail Structural Maintenance

Bud – identify PM activities required for structures along with man-hour requirements (use shop equipment analysis as an example)

Routine Maintenance

On an annual basis, the General Superintendent, Chief Supervisors, and Track & Guideway Supervisors review scheduled preventive maintenance, work orders cleared throughout the year, outstanding work orders, and equipment replacement schedules to identify priority needs and plan the workload for the upcoming fiscal year. Maintenance needs to be accomplished through the capital program during the year are identified and, where possible, are removed from the list of outstanding maintenance needs. The remaining work items are assigned to the appropriate area, i.e., structures, track and shop, and a work plan to meet the outlined maintenance needs within each area is established. Every effort is used to coordinate activities to maximize efficient and effective use of personnel and resources. An example of the work plan for the current year is as follows:

Work Plan

Lee, Bud, Bryan, and Bill – provide detailed description of how work is structured – a process flow diagram would help – bottom line – describe how work for the day gets scheduled (drill down) - The Track and Guideway work plan is based on frequent and comprehensive inspections of the track and the Metrorail and Metromover structures. Corrective action is based on established priorities. The work plan for the equipment shop is based on manufacture's recommended service intervals depending upon the use of the equipment.

MDT's commitment to Track and Guideway is reflected in the Track & Guideway Division operating budget, which is projected to exceed $5 million this fiscal year.

Operating Budget

The operating budget, presented below, reflects a .23% increase in Fiscal Year 2004/2005 and a .25% increase for Fiscal Year 2005/2006. The largest line item increases were observed in Stock Room inventory, mechanical maintenance parts, and maintenance Rail Operations.

Lee- your total = 5,076,000 doesn't match with what you provided

Track & Guideway
FY2006 Operating Budget

Category	***Allocation***
Salaries/Fringes	6,274,000
Salary Reimbursements	-735,000
Overtime	226,000
Other Outside Contractual Services	90,000
Other Outside Maintenance	50,000
Maintenance Rail Operations	112,000
Mechanical Maintenance - Parts	70,500
Expendable Tools	70,500
Stock Room/Inventory	94,000
Building Materials	20,000
Miscellaneous	451,000
Total	6,723,000

Replacement and Rehabilitation Projects Programmed/Needs

Capital Budget

Lee – provide copy of capital budget (Tentative)

Insert FY 2006 Capital Budget

Bud – provide overview of FDOT funding program + explanation of how it works + amount of funds received + what funding actually covers in terms of manpower/labor costs/repairs

On November 5, 2002, Miami-Dade County voters overwhelmingly supported the People's Transportation Plan by a margin of 2 to 1. In effect, voters approved a sales tax increase (6.5 percent to 7 percent) solely dedicated to transportation. The surtax is expected to generate $160 million in fiscal year 2004 and grow by 5 percent annually for a comprehensive grassroots transportation plan. Implementation of the associated set of projects and programs that have been committed to the residents, labeled the People's Transportation Plan (PTP), is being overseen and monitored by the Citizen's Independent Transportation Trust (CITT).

Track & Guideway-related projects ratified by the CITT include:

- Palmetto Yard road crossing rehabilitation
- Rehabilitation of seal glands in stations and throughout guideway
- Installation of mitered joints at rail stations
- Replacement of track plates in curves

The final schedule for these projects and initiatives is dependent upon the cash flow included in the Pro Forma. The Department is in the process of prioritizing all projects and initiatives.

Potential Future Projects

In addition to those projects previously identified in the capital program and the People's Transportation Plan, other track & guideway projects have been identified for future consideration. The current listing of projects, which appear to have potential for development in the future includes:

- Replace metal acoustical barrier with concrete barriers

- Replace 24-year old power rail coverboard
- Paint Metrorail guideway columns
- Replace rail fasteners in Palmetto Yard with Pandrol clips

IV. Maintenance Requirements

Preventive Maintenance

Jan - based on needs identified for PM + corrective action + Future Growth

Unscheduled Corrective Maintenance

Jan - based on needs identified for PM + corrective action + Future Growth

Equipment failure
Switch replacement
Frog welding

Contractor Maintenance

Lee – detail the following:

- **Process to evaluate in-house versus contractor**
- **Issues with Contractor Maintenance**
- **Staff and Material Commitments/Obligations**

Jan - based on Current + Extenuating + Future Growth

V. Warranty Recovery

The MDT Materials Management Division administers warranty recovery and is responsible for identification, recovery, and enforcement of warranty control for all items procured for Metrorail, Metromover, and Metrobus that are distributed through the warehouse and stockrooms.

Identification

- Materials Management develops, implements, and provides training for warranty procedures, including all instructions and forms and assists in training and coordination of warranty activities between division staff and outside vendors
- The history, usage, and reasons for division problem areas are investigated by Materials Management in detail
- Materials Management monitors the reliability of high failure rate of items to detect defects, which may result in facility-wide correction campaigns and product retrofits
- Materials Management utilizes computerized warranty control functions interfacing with Inventory Management, Equipment Management Systems, Information Management Systems, and Time Share Options

Recovery

- Materials Management has established and manages the warranty division/vendors relationship, and controls and directs all warranty and recovery activity
- Disputed warranty claims and processes to be used for retrofits and corrective campaigns are negotiated by Materials Management

Enforcement

- Materials Management prepares bid and proposal warranty provisions to maximize division benefits and to ensure that vendor's warranties are equitable to manufacturers' industry warranties
- Periodic visits to technical services/vendors to inspect and ensure the integrity of the warranty recovery process and vendor quality product line are performed by Materials Management
- Materials Management enforces and reviews division contracts/bid awards for federal compliance

- In conjunction with Management Information Services (MIS) staff, Materials Management creates, designs, implements, and maintains the Warranty Information Data Base System
- Materials Management negotiates and discusses with corporations, manufacturers, vendors, maintenance engineering, and maintenance management staff on cost savings, complex, sensitive, and highly-technical division issues

At the present time, Materials Management warranty recovery functions do not include the Track & Guideway Division. Concurrent with the implementation of the EAMS, Track & Guideway Division and MDT Materials Management will develop warranty recovery procedures for Track & Guideway Division specific items. The process will mirror the existing one, which has proven to be highly successful. At the present time, it is anticipated that EAMS will be implemented for Track & Guideway Division **Lee – need date** _____; however, implementation could occur sooner if the project moves ahead faster than expected.

VI. Track & Guideway Division Maintenance Plan

Mission

The mission of the Track & Guideway Division is:

The philosophy and goals of the Track & Guideway Division Maintenance Program Policy are to ensure that the tracks and supporting structure are safe sound and for passenger service. This is accomplished through daily track inspections and responding to all structural conditions reported through the bridge inspection program and **add reference to Track Maintenance and Inspection**. Cleaning of the guideway is also an important component of the Maintenance Program. Above all, safety is a primary concern as employees in this division work at heights, near an energized power rail and transit cars passing by. Quality assurance, which is the responsibility of the chief supervisors, is an important part of the Maintenance Program. The Maintenance plan also strives to maximize cost effectiveness of maintenance efforts consistent with safe operations through a proper balance of preventive maintenance, corrective maintenance, and systems improvements, where necessary.

The Division operates 24 hours a day, 7 days a week under the direction of a General Superintendent (pending reclassification) who reports to the Assistant Director, Rail Services. Maintenance of MDT Track & Guideway is accomplished through the efforts of 136 Track & Guideway staff.

The Track & Guideway Division's commitment to continuous improvement is exemplified in the development of a Track & Guideway Equipment and Maintenance Plan, extensive update of the existing equipment inventory, and recent documentation of work-related activities. Toward that end, the Track & Guideway Division has identified a number of activities to be undertaken within the next two years not only to maintain but also to enhance the quality service that has become standard within the Track & Guideway Division.

Objectives

Objective 1: Track & Guideway Availability

To ensure Track & Guideway systems and station structures are safe for the general public as well as passengers, and are operational and available to customers and employees.

1. Establish criteria to be used in the decision-making process to determine whether work is done in-house or contracted-out
2. In coordination with Rail Maintenance Control, develop a work order tracking system for Remedial Action Reports (RAR)
    i. Work Orders for RARs are generated and tracked by Rail Maintenance Control
    ii. Additional data contained in completed Work Orders includes equipment and equipment operator requirements as well as materials and/or parts used
    iii. Track completion time of each Work Order from time open to time closed
3. _____

Objective 2: Equipment Availability

To ensure that Track & Guideway equipment, including light and heavy shop equipment, is maintained for maximum availability and safety.

1. Establish target for preventive maintenance requirements
2. Reallocate manpower based on identified preventive maintenance and repair needs
3. Incorporate repair data into the maintenance planning process
    i. Establish improvement goal based on performance to date
4. Establish an interim process to identify and track warranties until EAMS is on-line
    ii. Create list of existing warranties
    iii. Establish mechanism to add new warranties to database
    iv. Incorporate warranty check prior to implementing repair work
    v. Designate a Track & Guideway staff member to coordinate warranty work

Objective 3: Track & Guideway Appearance

To ensure that the Track & Guideway and station structures are clean and present a safe and comfortable environment for customers and employees. This includes pressure washing acoustical barrier panels, station fascia panels and weekly cleaning of trash in the tracks through the stations.

1. Eliminate rainwater leaking into station
    i. Establish third shift structural maintenance crew

ii. _____
iii. _____

2. _____

Objective 4: Track & Guideway Improvements

To modify or change existing Track & Guideway systems and station structures in support of on-going operations with Engineering and Code Requirements.

1. Coordinate data collection efforts with Information Technology (IT) staff to ensure the new EAMS system provides timely and relevant information
    i. Utilize available data in maintenance and inspection planning processes
2. Replace metal acoustical barrier with concrete barrier
    i. _____
    ii. _____
    iii. Contract out through Transit Engineering

Implementation Monitoring

The process of developing the Track & Guideway Division Equipment and Maintenance Plan has provided the Division with a wealth of detailed information concerning not only the areas and equipment under the Division's span of control but also with a knowledge base that can be used to improve the operations. The exercise also created true working partnerships with Rail Maintenance Control and Field Engineering.

Throughout the next year, the Track & Guideway Division will establish benchmarks for each of the improvement activities identified above and will formally report their progress in each of the areas to the Assistant Director, Rail Services, at the end of the year.

The annual report will let the Track & Guideway Division determine their progress to date in achieving their mission and will serve as the foundation of the Track & Guideway Equipment and Maintenance Plan for the future

Appendices

Appendix _
Miami-Dade Transit
Track & Guideway Division
Maintenance Program Policy

MIAMI-DADE TRANSIT
TRACK & GUIDEWAY DIVISION
MAINTENANCE PROGRAM POLICY

Effective Date: _____

I. CONTENT:

II. POLICY

1.0 Maintenance Program Philosophy/Goal:

- Maximize cost effectiveness of maintenance efforts consistent with safe operations through a proper balance of preventive
- Maintenance, corrective maintenance and hardware/software improvement.

2.0 Purpose of Maintenance Program:

- To maintain the designed safety and reliability levels of the equipment.

- The Maintenance Program recognizes that maintenance cannot correct deficiencies in the designed safety and reliability levels of equipment. At best, the maintenance program can only prevent deterioration from the design levels. If those inherent levels are found to be unsatisfactory in service, design modification is necessary to obtain improvement.

3.0 Maintenance Program Objectives:

- To ensure realization of design safety and reliability levels of equipment.

- To restore safety and reliability to their inherent levels when deterioration has occurred.

- To obtain the information needed to improve design of item whose inherent reliability proves inadequate.

- To accomplish these objectives at minimum total cost, including maintenance costs and the costs of residual failures.

4.0 Types of Maintenance:

- Planned/Scheduled Maintenance:
  - PMs and Modifications

- Nonscheduled Maintenance:
  - Correction of discrepancies found during PMs, modifications, other unscheduled maintenance, normal operations or data analysis.

- Planned, Non Scheduled Maintenance:
  - At times, discrepancies found during PMs, modifications, or other unscheduled maintenance, normal operations or data analysis, can be deferred and a shop visit planned and scheduled for a later time to correct the discrepancy. Discrepancies affecting safety or operational reliability cannot be deferred.

5.0 Maintenance Program Accomplishment:

- Scheduled Tasks-Modifications:

  - Accomplished in accordance with plan.

- Objective: to improve safety, reliability or maintainability.

- Scheduled Tasks – PM inspections:

  - Accomplished at specified intervals.

  - Objective: to prevent deterioration of equipment from designed safety and reliability levels.

  - Types of Tasks:
    - Lube/Servicing
    - Operations/Visual Check
    - Inspection/Functional Check
    - Condition Testing and Recording
    - Restoration
    - Discard

- Nonscheduled Tasks:

  - Accomplished as required.

  - Generated from:
    - Scheduled Tasks
    - Malfunction Reports
    - Data Analysis

  - Objective: restore equipment to acceptable safety and reliability levels.

6.0 Maintenance Program Efficiency:

- Schedules only those tasks necessary to meet stated objectives.

- Does not schedule tasks that will increase maintenance costs without a corresponding increase in reliability or safety.

7.0 Scheduled Maintenance Application:

- Track System scheduled maintenance program will be such that the trackwork system meets or exceeds standards specified in the MIAMI-DADE TRANSIT RAIL OPERATIONS (DIVISION) STANDARD OPERATING PROCEDURES, P.M. GP-03 (Safety Standards for Inspection and Maintenance of Track).

- All fixed, mobile and transportable equipment used in the delivery and maintenance of MDTA Rail and People Mover (Automated

Guideway) transit service will have periodic preventive maintenance inspections and servicing.

- PM Inspections and servicing will consist of routine tasks as described above under Program Content, Scheduled Tasks.

- Campaign Inspections are short term inspections of specific hardware items for the purpose of assessing status or condition. Such inspections can be initiated by the maintenance engineer, maintenance supervision of management or Rail Maintenance Control. Such inspections are temporary in nature and are not considered as part of the approved PM program. Campaign inspections, while independent of the PM program, may be ordered and scheduled in conjunction with routine approved PM inspections as a matter of expediency.

8.0 Scheduled Inspection/Tasks Specifications:

- Specifications for PM performance will be derived from manufacturer's recommendations as modified by experience and engineering analyses of the hardware and its use.

- PM performance specifications will include specific tasks, procedures, methods, tools and test equipment where appropriate, frequency of performance, dimensions/tolerances, rates, distances, clearances, quantities, viscosities, and other such standards as appropriate.

9.0 Deviation from Maintenance Program Specifications:

- No deviations from any approved PM task, procedure, method, frequency or other specification that exists to insure public/employee safety are permitted.

- Deviations from approved PM tasks, procedures, method, frequency or other specifications that exist solely for reliability, maintainability or other economic reasons, may be authorized by written approval of the Assistant Director, Transit Services or higher authority. Such deviations from the approved PM program will be authorized only under extreme circumstances.

10.0 Maintenance Program Records:

- Records required by Federal and State agencies to verify scheduling and accomplishment of the approved PM program inspections shall be maintained in good order and accessibility.

- Such records as necessary to support warranty and other claims and analyses for economic reliability, maintainability, performance, quality control and PM program revision purposes shall also be maintained in good order and accessibility.

11.0 Maintenance Program Revisions:

- Program Continuously Examined.

In addition to revisions resulting from hardware systems changes, the maintenance program is continuously examined for potential improvements based on reliability/maintainability historical experience.

- Initiation of Revision.

Program changes can be identified and recommended by numerous sources; for example, the County's Employee Suggestion Program, Supervisory Staff, Rail Maintenance Control and others.

The actual change is initiated by a memo of recommendation with supporting justification from the General Superintendent in whose area of responsibility the program procedures fall. In general the changes add or delete tasks from a routine inspection bill of work or increase/decrease an inspection frequency. Specification changes and methods changes are also included.

- Approval of Revision.

A copy of the affected procedure is modified by Maintenance Control per the General Superintendent's recommendation and circulated, along with the justification and supporting documentation, for review and approval/disapproval by all affected Division Chiefs, Office of Safety and Security and the Assistant Director if the change is a deviation from the as-built drawings.

If the change is approved by consensus, it becomes effective as soon as all appropriate paperwork is revised and issued. If disapproved, the recommended change is returned to the initiating engineer with reasons for disapproval. The General

Superintendent then may take appropriate action to allay objections or drop the case, depending on the situation.

- Increases to Maintenance.

Additions to the program and changes that increase the intensity of maintenance may not go through the entire approval process; recommendations through maintenance personnel, if approved by the General Superintendent, that require the additional maintenance, are then discussed with Maintenance Control.. If there will be no scheduling problems, no further approvals are necessary. Otherwise, the recommended change enters the normal approval process. Changes of this type usually originate with the maintenance department involved who notify the General Superintendent of their need. The Chief Supervisor of the respective section prepares the recommended change and initiates the process illustrated in the attached flow chart.

- Additions in the form of newly created preventive maintenance procedures will be treated the same as revisions resulting in a decrease in intensity of maintenance (see Section 11.0, paragraphs 2 and 3).

12.0 Maintenance Program Revisions Justification:

- Approval Process.

A good preventive maintenance program is constantly under scrutiny for its cost-effectiveness, and as a result, there will be frequent revisions to improve procedures.

Revisions that delete tasks, increase inspection intervals or otherwise reduce the intensity of maintenance are subject to an approval process. In some instances, the changes may require the approval of the Office of Safety and Security, and any division head whose area of responsibility may be affected, as well as the Assistant Director.

- Revision of a PM Procedure

The procedure improvement can be proposed by anyone; however, the written PM procedure revision must be recommended in writing by the appropriate Chief Supervisor. The Chief Supervisor must describe in a memo that will accompany the revised procedure through the approval/sign off process, the reasoning and justification for the proposed revision.

- Justification.

The Chief Supervisor's memo must address, as a minimum, the following concerns of those who must provide their approval or disapproval of the revision:

- The purpose of the revision, why it is proposed.

- What are the changes being recommended? Are tasks being added, deleted, modified, simplified, etc., are specs being changed, methods changed, test equipment changed; etc.

- What effect will the change have on the following:

  * Safety?
  * Reliability?
  * Maintainability?
  * Operations/System Performance?
  * Costs?

- A description of the analysis that supports the recommendation to revise the procedure. The analysis may be a detailed study of the results of previous accomplishments of the procedure, an analysis of failure data, or it may be an industry survey, or a vendor's recommendation, or even a logical rationale, in the absence of all other hard data.

The Chief Supervisor's memo is to be complete enough that the revision will pass through the approval route without generating questions or objections from those who must sign their approval.

13.0 Conditional Maintenance Program Revisions:

- The approval process for revisions to the program may impose conditions on the revision.

  - There may be occasions when a test period with appropriate data collection and analysis to establish the efficacy of the change may be required by one or more of those individuals who must approve the change.

- The General Superintendent specifies criteria for a successful test.

  - The General Superintendent specifies length of test, data collection and analysis requirements and defines a successful

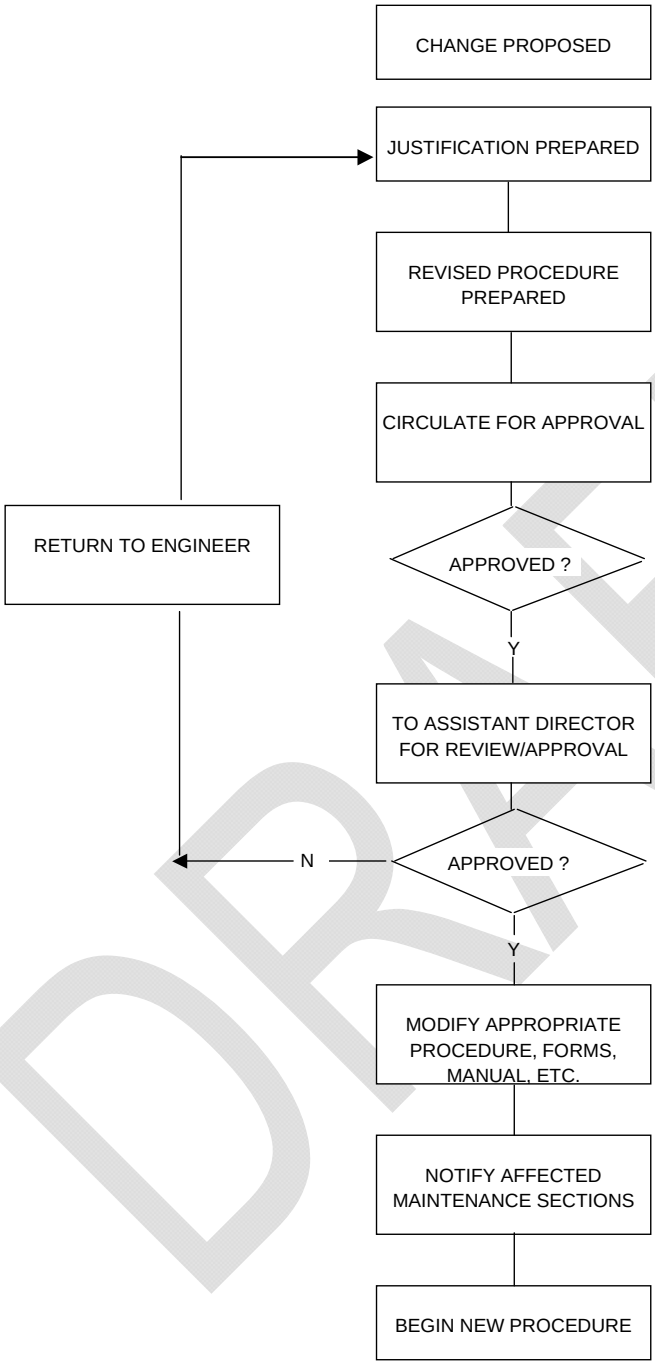
outcome of the test and resubmits the recommendation for approval.

- Conclusion of test.

  - If successful, a report summarizing the results will be prepared and circulated with the revised PM procedure for final approval.

  - If unsuccessful, the original procedure is restored and the concerned parties are notified of the action.

MAINTENANCE PROGRAM
REVISIONS FLOW CHART



MINIMUM: 3 APPROVALS REQUIRED FOR NEW OR REDUCED MAINTENANCE PROCEDURES
2 APPROVALS FOR ADDITIONS TO MAINTENANCE

Appendix _
Miami-Dade Transit
Track & Guideway Master Preventive Maintenance Listing

Track & Guideway Master Preventive Maintenance Listing