

Traffic Flow Management System (TFMS)

1st Level Field Site Hardware Support Overview

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Federal Aviation
Administration

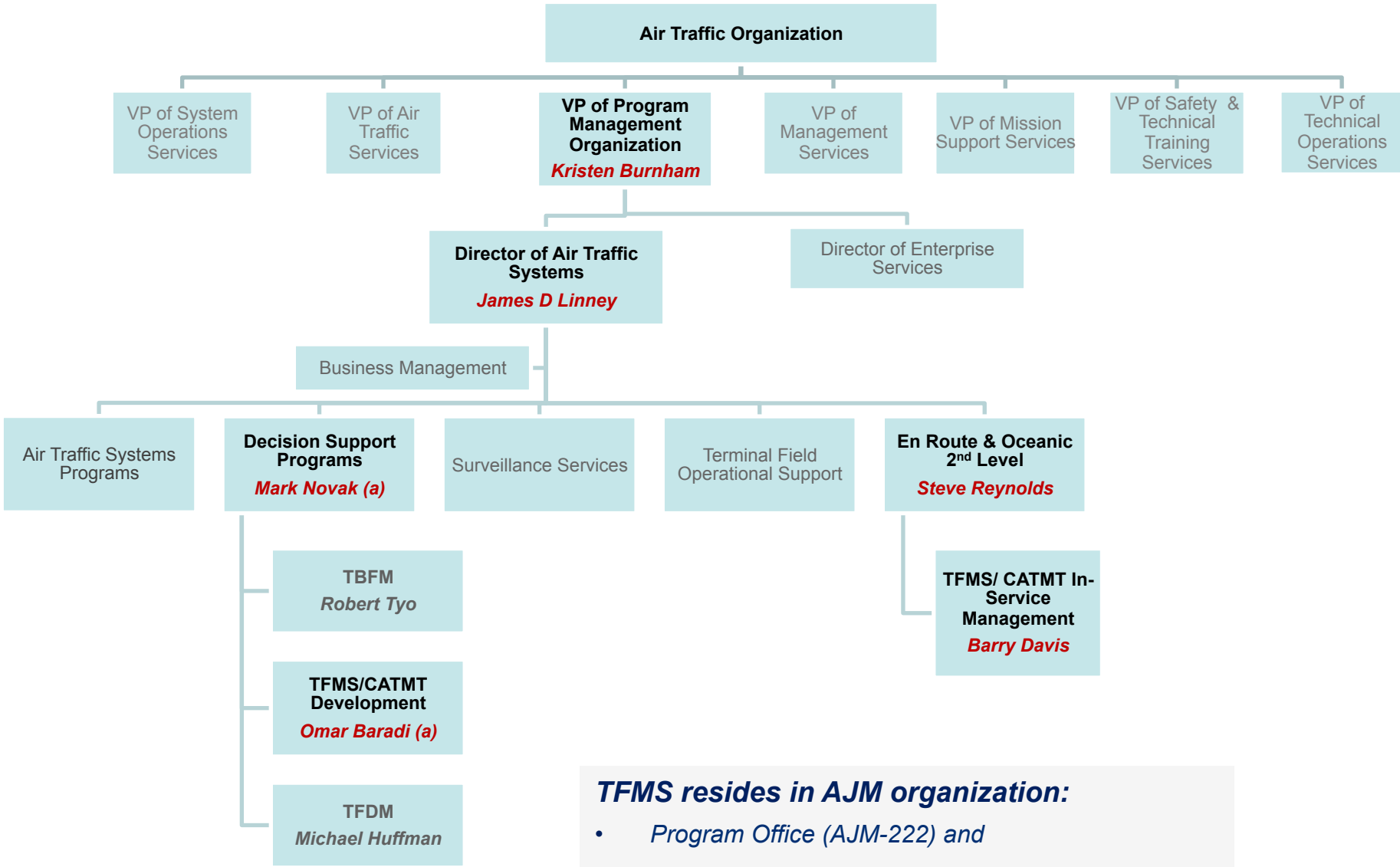


Agenda

- **TFMS Overview**
 - Organization
 - System Role
 - System Infrastructure
 - System Overview
- **TFMS 1st Level Field Site Hardware Support**
 - Maintenance concept today and tomorrow
 - Scope of transition
 - Tech Ops role in replacing failed equipment
 - Failure rate trend
 - Plan and timeline for tech refresh
- **Work Group**
 - Work group Overview
 - Activities
 - Transition Plan



Organization (Who Are We?)

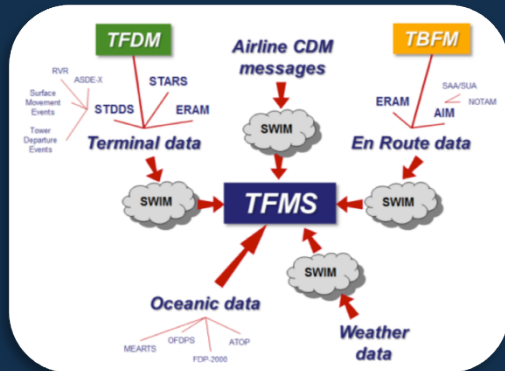


TFMS resides in AJM organization:

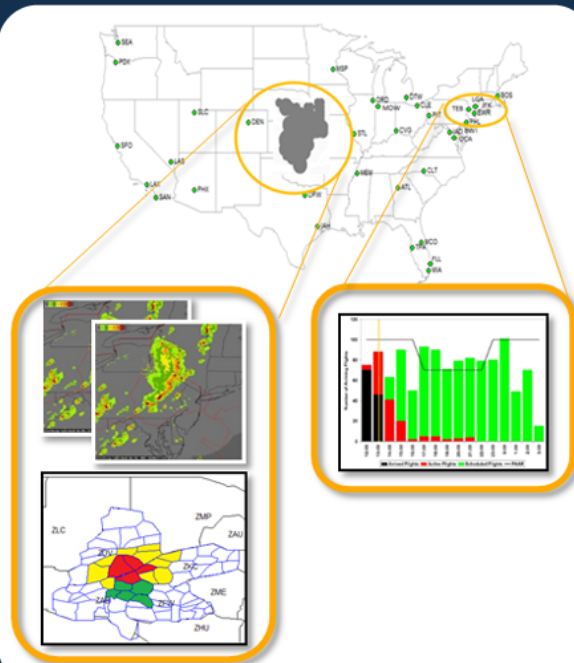
- Program Office (AJM-222) and*
- Second Level Engineering (AJM-252).*

TFMS: *Focusing on efficiently improving the “greater NAS”*

Monitors demand and capacity for primary NAS resources



Assesses the impact of NAS disruptions and provides alerts

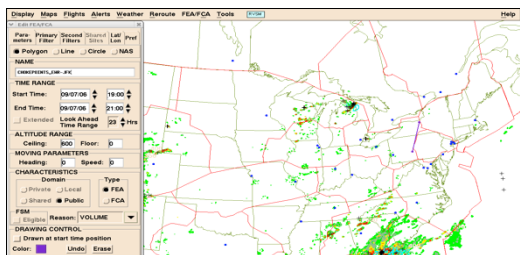


Implements the NAS strategic plan to balance demand with available capacity

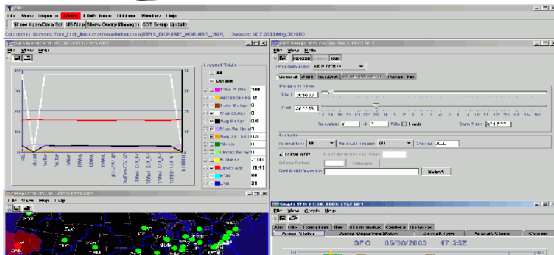


Receives updates from other NAS systems and makes adjustments to this plan as needed

TFMS – Collection of Systems and Interfaces



Traffic Situation Display



Flight Schedule Monitor

Options	Edit	View	Tools	Information	Print	Reports	Link	Search	Help
Misc									
RSTN									
MRSTN									
GStop									
APREQ									
Delay									
RWY									
Sum									
EQ									
Log									
McConv									

National Traffic Management Log

Restrictions BOS WHITE 6MIT JETSPD: 210 ALT: AOA333 1900-2100 ZDC:ZBW SEA WHITE 12MIT 2100-2200 ZDC:ZSE MSP WHITE 5MIT 1939-1942 ZDC:ZMP Ground Stops GS All ARR BWI 1941-1945 WX:SNOWICE GS All ARR DTW 2100-2200 WX:SNOWICE MISC Entries Blank spaces can be added before entries. Hard returns may be added to ESIS entries.	Outages DCC ARTS 111-A OTS 1941-UFA
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Enhanced Status Info System

CONTROL	START	END	SCOPE	REASON	AVG AAR	PR	ADVZY	DA
IAH	1159	1959	ALL	WEATHER / THUNDERSTORMS	75	36	36	024

Operational Info System



fly.faa.gov



Playbook

Selection	ACID/CID	Type	Rwy	DSP	St	CS	Fk	Dest	Delay
	VARS81/091	BESB/G	4L	1855	C	BREZY	GRIK1	RTV	0
	COA229/138	0728/H	4L	1923	P	DIXIE	HANTA	HQSP	0
	COA33/942	H/0C18/H	4R	0723/13-20	L	CAF	DIXIE	HANTA	SBGL 320

Departure Spacing Program

30+ user/data interfaces

TFMS 1st Level Field Site Hardware Support Overview



Federal Aviation Administration

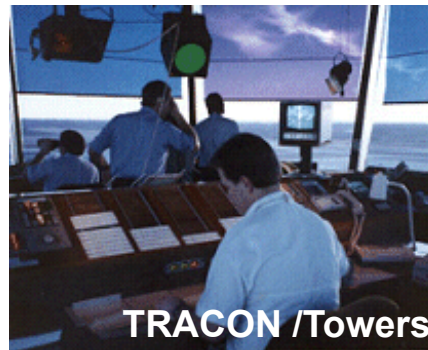
TFMS Infrastructure



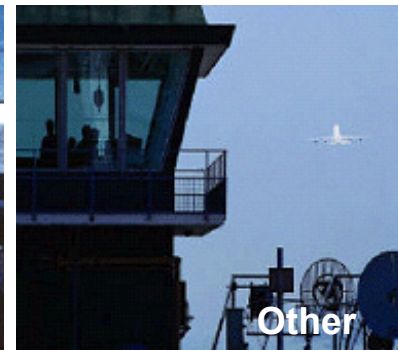
ATCSCC



ARTCC



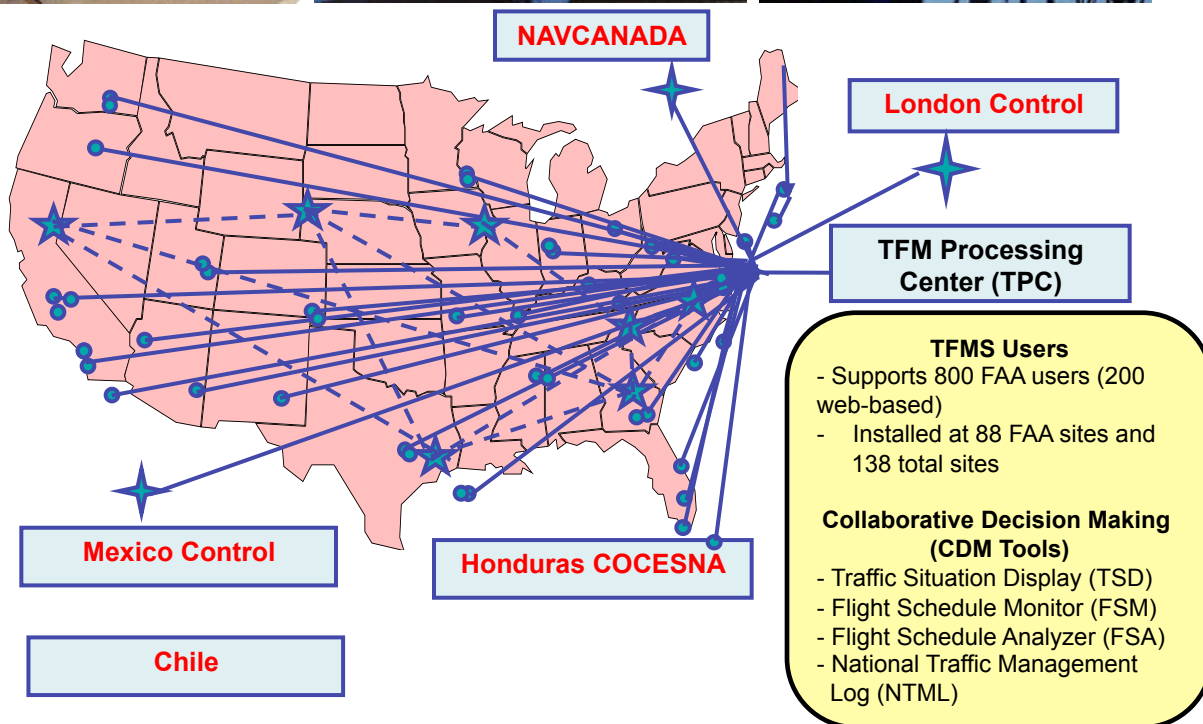
TRACON /Towers



Other

TFMS Operational Locations and Service Delivery Points

ATCSCC – Vint Hill, VA
TFM TPC – Technical Center – FAA
Disaster Recovery Center (DRC)
FAA HQ and Academy
Contractor Sites (1)
R&D (4)
Traffic Management Units at:
ARTCCs (21)
TRACONs (35)
CERAPs (3)
Regional Offices (5)
Towers (19)
Airlines (24) & AOCs
Military (9)
International Sites (17)
U.S. Government Locations (7)



TFMS Overview

- **NAS Enterprise System and decision support tool that predicts system constraints and facilitates the collaboration and mitigation with stakeholders.**
 - A primary tool suite used by Traffic Management Units (TMU)
 - Facilitates numerous collaborative interactions with external NAS users and other FAA systems.
- **TFMS architecture is composed of:**
 - COTS hardware and software infrastructure
 - Custom TFMS application software
 - Centralized with the TFMS Processing Center (TPC) at WJHTC and field sites at all TMU locations, called TFMS Remote Site (TRS)
 - Service delivery points to international, military and other government agencies (FAA does not supply equipment)



TFMS Maintenance Concept

Today & Tomorrow

- **Today TFMS is contractor maintained from the TFMS Production Center (TPC) at the WJHTC**
 - Warranties and some sparing used for hardware support at all FAA locations
 - In addition, 4 hour response time service plan with OEM vendor
- **Goal is to transition 1st Level Field Site Hardware Support to local Tech Ops**
 - Tech Ops would replace failed TFMS field site hardware or component instead of OEM vendor
 - Tech Ops would be responsible for 1st level hardware support for TFMS Remote Sites in the field (ARTCC, TRACON, ATCT, CERAP).
- **Benefits**
 - A standardized and formalized approach to technical support in the field for TFMS.
 - Outage time will be reduced.



Scope to be Transitioned

- **TFMS field hardware, such as:**
 - File servers, workstations, monitor, printers, routers, switches and components (i.e. keyboard, mouse, trackball)
- **Support agreement will include the following TFMS Field Sites:**

Facility Type	Number of Facilities	Average Number Per Site				
		Workstations	Monitors	Printers	Routers	Switches
ARTCC	21	17	26	2	3	3
TRACON	35	7	10	2	2	2
ATCT	19	4	5	1	2	2
CERAP	3	5	6	1	2	2

* Not in scope: other TFMS sites not included in this process: TFMS Disaster Recovery Center (DRC), ATCSCC, FAA HQ, Regional Offices, FAA Academy, WJHTC and Prime Contractor Facility

Tech Ops Role in Replacing Failed Equipment

(after transition)

Today

- TRS TMU or Tech Ops calls TFMS Helpdesk.
- TFMS Helpdesk trouble shoots remotely and determines equipment failure.
- TFMS Helpdesk calls equipment OEM per warranty and service agreements and links them with call initiator.
- Call initiator coordinates replacement of the equipment
- Coordinate access for OEM contractor
- Escort contractor to position/Remain with contractor
- Track and Receive shipment(s) of replacement part or unit
- Contact shipping company to coordinate pick-up of returning part or unit
- TFMS Helpdesk/ TPC loads TFMS software remotely as needed

Future

- **TRS Tech Ops logs outage**
- **TRS Tech Ops troubleshoots workstation (According to checklist)**
- **If the issue is resolved log as resolved**
- If not resolved, Tech Ops calls TFMS Helpdesk (TPC)
- TPC troubleshoots remotely
- If not resolved, Tech Ops replaces failed unit with spare.
- TFMS Helpdesk/ TPC loads TFMS software remotely
- **Out of service unit is boxed and shipped to FAA Logistics Center and replacement spare component (workstation, keyboard, monitor, etc.) is shipped to site.**

***** Flow chart in backup***



Field Site Failure Trend (2010- Dec 2013)

- Representative workstation failure trend after tech refresh
 - Average failed workstation/component in
 - 2010 was 0.4 per site
 - 2011 was 0.6 per site
 - 2012 was 0.9 per site
 - 2013 was 0.5 per site
 - Printer and monitor failure trends are in back-up

Qtly Hardware Repair/Replacement Tickets - 2010 thru 2013 December	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	Total
Workstation - Fan	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Workstation - Hard Drive	1	3	1	1	19	1	4	14	5	18	16	15	3	4	10	6	121
Workstation - DVD-R	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	3
Workstation - Controller	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Workstation - NIC	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
Workstation - Keyboard	1	1	0	0	2	1	0	0	2	1	1	2	0	2	1	0	14
Workstation - Memory	0	0	0	0	0	0	0	0	0	0	1	2	1	0	2	0	6
Workstation - Mouse	0	1	1	1	1	1	2	0	0	0	1	3	1	0	1	0	13
Workstation - Power Supply	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
Workstation - System Board	2	5	2	0	1	0	0	0	1	0	0	0	0	3	1	0	15
Workstation - Trackball	1	2	2	0	1	0	0	0	2	1	0	0	0	4	0	0	13
Workstation - Video Card	2	4	1	0	1	5	0	1	3	0	1	0	0	1	0	0	19
Workstation - Sunhillo ICA-486P EMULEX 486	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	3
Total	8	17	7	3	25	9	6	16	17	22	20	22	7	14	16	7	216

Note: Workstations & file servers = 946 (across 88 FAA sites)

TFMS Remote Site (TRS) Tech Refresh

- **Includes spares procurement to maintain availability until tech refresh is completed.**
 - Use of existing TFM-M contract
- **Tech Refresh performed in 2017-18**
 - Provides a hardware replace-in-kind, with no change in architecture or new functional enhancements, of the existing operational TFMS equipment in the field.
 - Anticipated use of future TFM contract
 - HW includes items such as: file servers, workstations, monitors, keyboards, routers and switches.
 - At 89 locations (88 FAA locations and prime contractor facility)

Hardware Transition Workgroup

- **Purpose: planning and implementation of details and strategy for transition of TFMS 1st Level Field Site Hardware Support to Tech Ops.**
 - Such as timing, training, orders, processes, procedures, documentation, and logistics.
 - Members represent the following Lines of Business:
 - AML - Logistics Center Organizations
 - AJW - Technical Operations Services Organization
 - AJM – Program Management Organization -Air Traffic Systems
 - AJI - Safety and Technical Training
 - AJR - System Operations Services
 - PASS Representative
- **Kick-off Meeting July 30, 2014**



Workgroup Activities

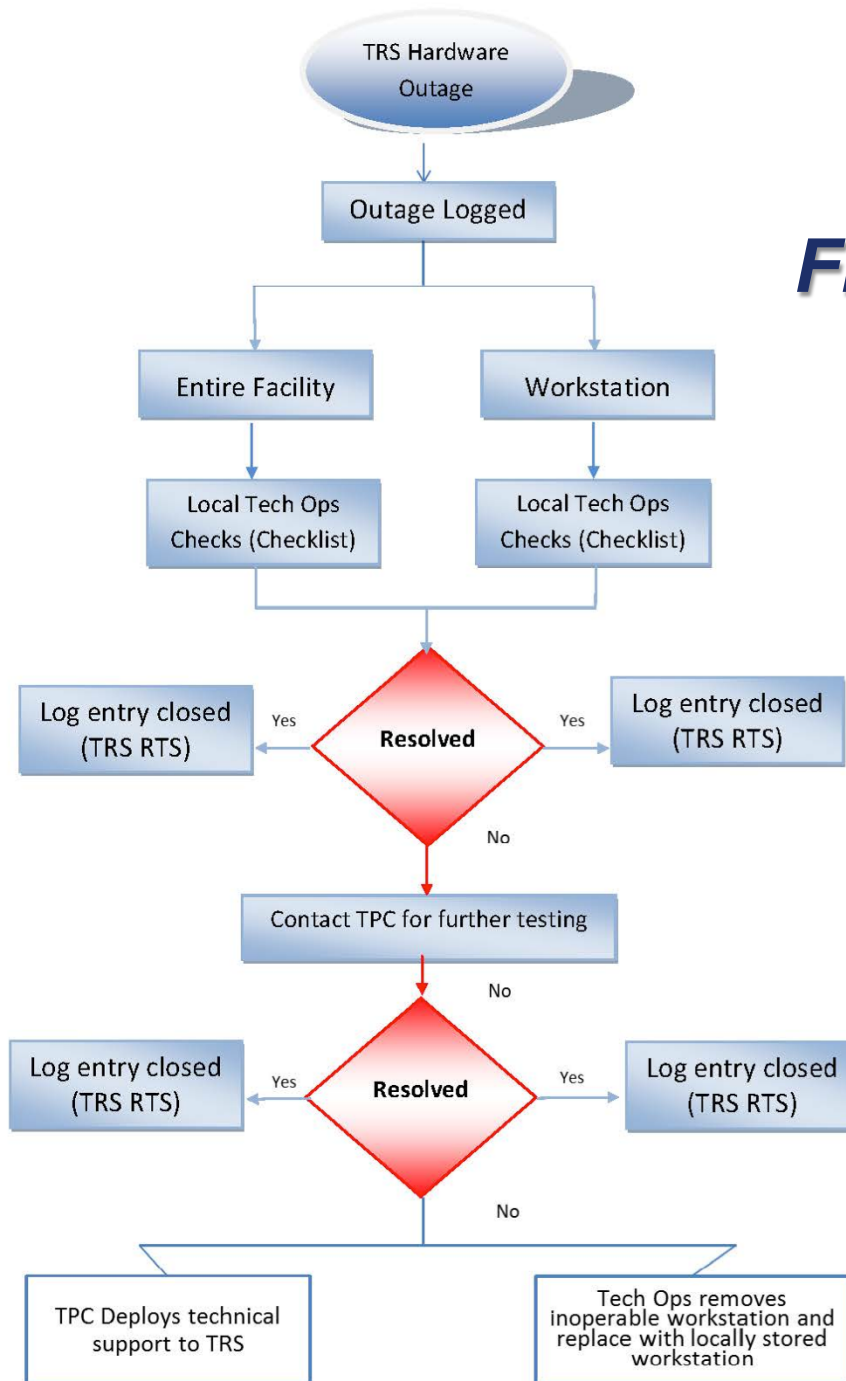
- **Logistics processes:**
 - Define process from cradle to grave. Investigating feasibility of using existing FAA tracking system for ordering and tracking replacement equipment.
- **Training:**
 - Identify and define training requirements. Determine how training will be delivered and met.
- **Tech Ops and Program Office Agreement:**
 - Outlined procedures for field equipment support
- **Pending topics:**
 - Develop checklist that will be used by the technician for 1st Level troubleshooting.
 - Determine what outage logging tool to be used by technician and contractor when an outage occurs.
 - Logistic procedures that are inline with the current system used by technicians.

Timing of Transition

- **Workgroup has determined**
 - To transition after TRS Technology Refresh is completed at each site.
- **Items for consideration**
 - TFM-M contract ends in 2016.
 - It will take time and money to integrate contractor systems and processes with FAA systems, and may not be completed by the time the new contract is in place.
 - FAA order update process will take a year
 - TRS Tech Refresh equipment will be selected just after an order is updated, if update started today.
 - Training
 - Opportunity to avoid duplication of training and overlap in update of training material. Hands-on training can take place on-site during tech refresh install. Tech Ops technicians could receive equipment orientation on-site during new hardware installation. (Hardware, cables runs, switches, etc.).

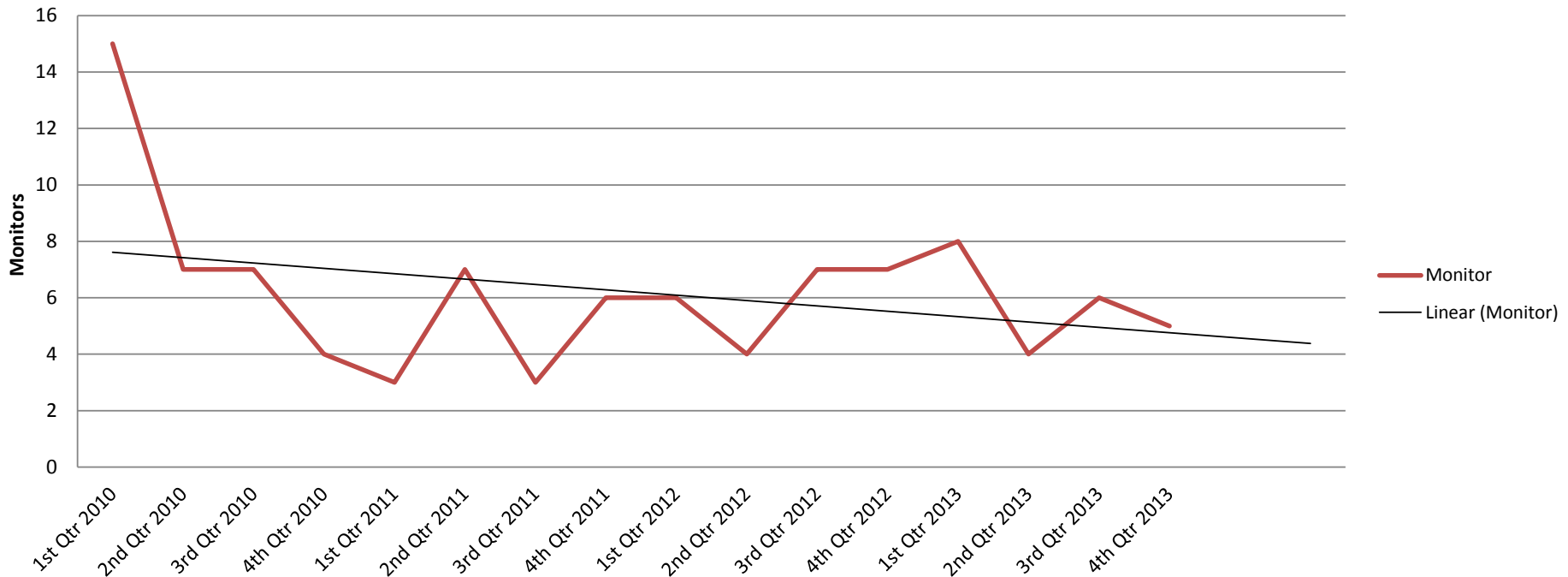


Process after Transition of the Field Site 1st Level Support

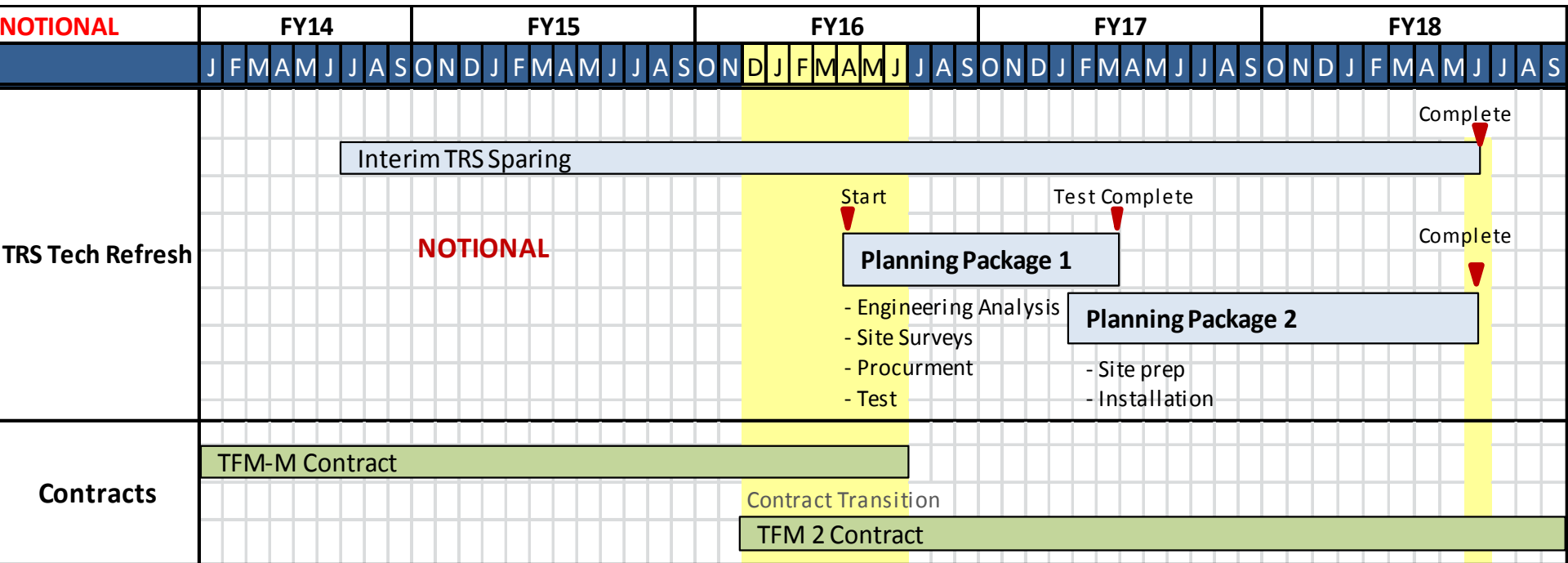


TRS Failure Trend (2010- Dec 2013)

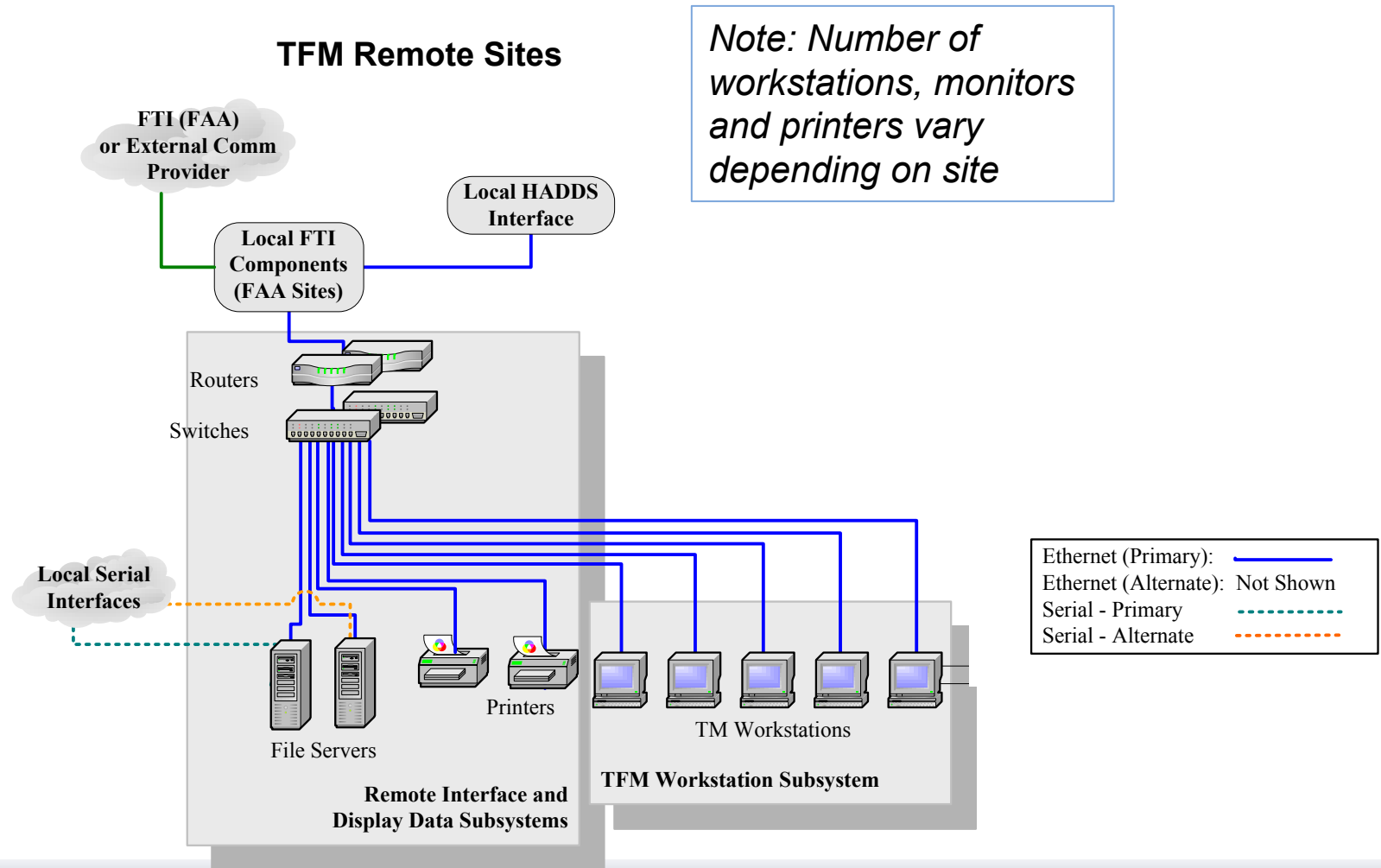
Quarterly Trending - Monitor Replacement
January 2012 thru December 2013



Notional Combined Schedule (TRS Tech Refresh and CATMT WP4)



Representation of a TRS Field Site



Abbreviation & Acronym List

Abbreviation	Meaning	Abbreviation	Meaning
ACAT	Acquisition Category	HQ	Headquarters
ADC	Airport Demand Chart	HW	Hardware
AOC	Airline Operations Center	IARD	Investment Analysis Readiness Decision
ARTCC	Air Route Traffic Control Center	NAS	National Airspace System
ATC	Air Traffic Controller	OEM	Original Equipment Manufacturer
ATCSCC	Air Traffic Control Systems Command Center	O&M	Operations and Maintenance
ATCT	Air Traffic Control Tower	R&D	Research and Development
CATMT	Collaborative Air Traffic Management Technologies	RMT	Route Management Tool
CDM	Collaborative Decision Making	SE	Systems Engineering
CIP	Capital Investment Plan	TBFM	Time Based Flow Management
COTS	Commercial-off-the-Shelf	TFDM	Terminal Flight Data Manager
CPU	Central Processing Unit	TFM	Traffic Flow Management
DRC	Disaster Recovery Center	TFM2	Traffic Flow Management 2 contract
EOL	End-of- Life	TFMS	Traffic Flow Management System
EOS	End- of-Support	TLVD	TFMS Large Video Display
F&E	Facilities and Equipment	TMC	Traffic Management Coordinator
FDIO	Flight Data Input Output System	TMU	Traffic Management Unit
FID	Final Investment Decision	TPC	TFM Processing Center
FSA	Flight Schedule Analyzer	TRACON	Terminal Radar Approach Control
FSM	Flight Schedule Monitor	TRS	Traffic Flow Management System Remote Site
FY	Fiscal Year	WJHTC	William J. Hughes Technical Center
		WP	Work Package