MDOT
Michigan Department of Transportation

Fleet Performance Metrics

2012 National Equipment Fleet Management Conference

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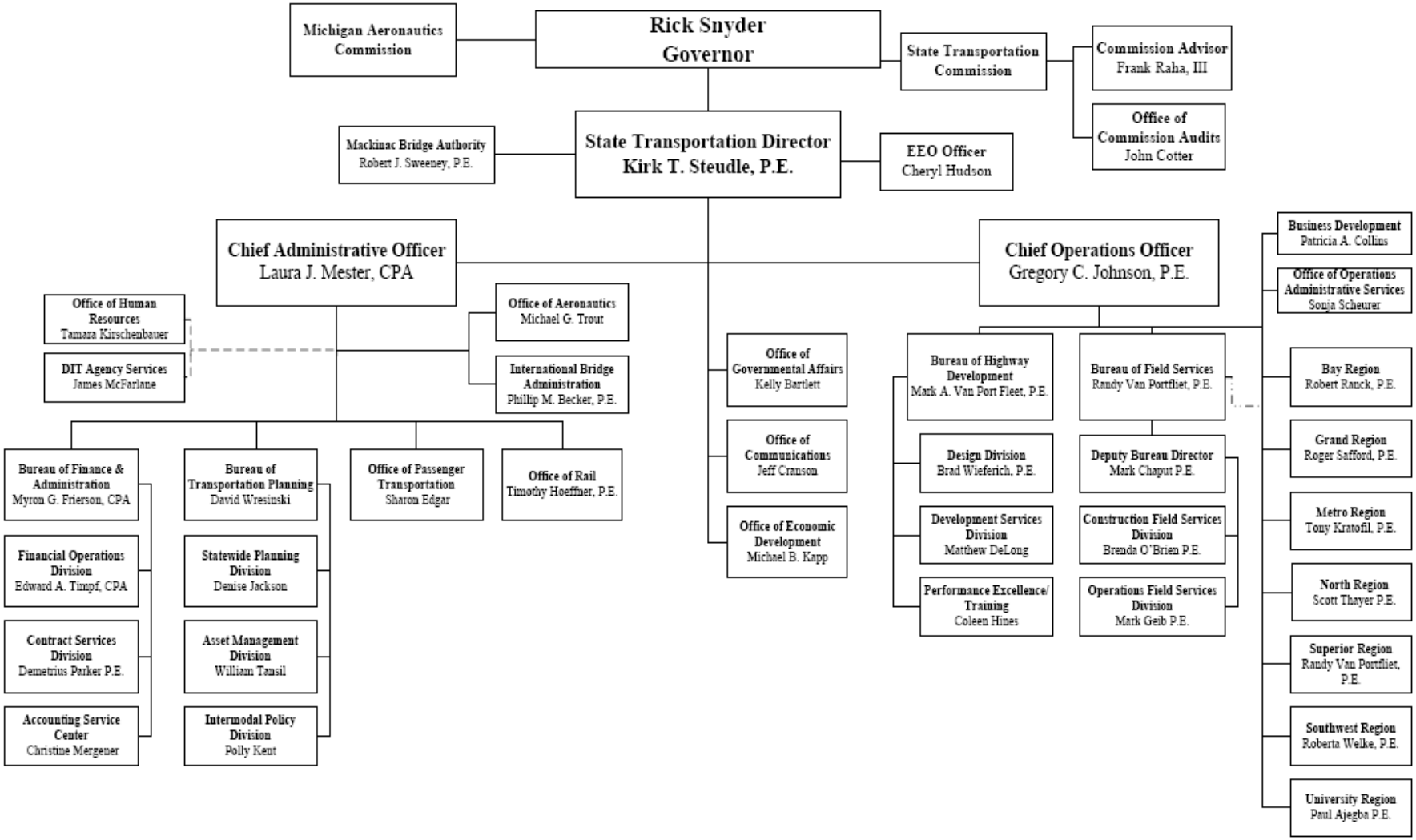
Performance Metrics

Michigan Department of Transportation

(February, 2012)



FOCUS: National Performance Metrics

- Northeast/Midwest Conference – October 2010
  - Pittsburgh, Pennsylvania
  - Discussed age-old "issues":
    - Not enough funding for fleet/equipment
    - Fleet/Equipment not recognized as a priority
  - Discussed products/deliverables/accomplishments
- MAASTO – July 2011
  - Several concurrent sessions on "performance measures"
- Northeast/Midwest Conference – August 2011
  - Kansas City, Kansas
  - Presentation on Fleet Performance Metrics
  - Decided on top/first four metrics based on Survey
    - Northeast – Preventive Maintenance and Retention
    - Midwest – Utilization and Downtime/Availability
- Federal, State, Local Levels
  - **Performance Metrics/Performance Management**

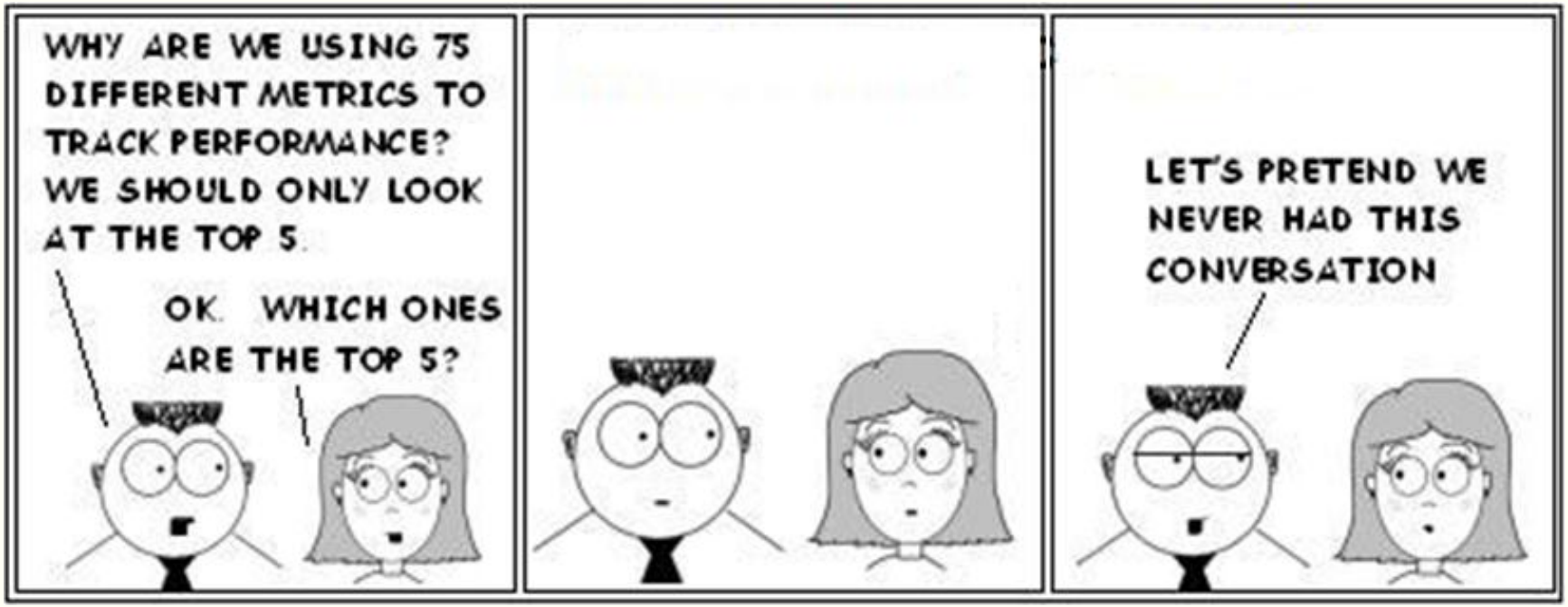
Key Messages

- Every state is using performance metrics, but there are considerable differences among the states
- Tie performance metrics to department strategic plan and tie to operations
- Be careful about setting targets/be careful what you measure/tendency is to measure what is easiest
- Don't have to be perfect…incremental progress is ok.
- AASHTO focus on performance management
  - Created a standing committee on performance management
  - Advocating a state driven approach based on **national** goals
- Yes, national performance metrics mean benchmarking/comparison, but…focus should be on collaboration among the states to improve and share best practices--UNITED WE STAND, DIVIDED WE FALL

Lessons Learned, So Far…

- FACT: Have to be able to document what you are doing, how you are doing it, and why.
- Don't necessarily need a fleet management system, but need an effective way to gather, collect, and report on the metrics.
- Statewide, coordinated, organized approach important
- Planning and evaluation/re-evaluation cradle to grave
- Be careful what you measure (it will drive behavior!)
- Careful evaluation of metric "suggestions"
- Statewide continual training is imperative
- Performance Metric reporting and incremental progress has resulted in renewed support/recognition

Performance Metrics



Performance Metrics

- Why Measure Performance?
- What makes a good metric?
- Reporting Metrics
- Survey
- Midwest/Northeast Issue Statements
- Michigan DOT Metrics
- Questions
- Discussion
- Potential Next Steps

Performance Metrics

"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it."

H. James Harrington
(Former Chairman and President of the International Academy for Quality and of the American Society of Quality Control.)

Why Measure Performance?

- An opportunity to better manage and operate your fleet
- Creates benchmarks to track performance
- Brings focus to improvement efforts
- Part of strategic approach to fleet management
- Enables one to know where they are in relation to where they want to be
- Accountability/transparency
- An opportunity to tell your story

What Makes a Good Metric?

- Fits organizational/operational need and aligns with strategic plan
- Specific in nature with a clear definition
- Identify measurement need/result
  - Leading indicator
  - Lagging indicator
- Source of Data/Customer Input
  - Need to balance wants vs. needs
  - Need to balance b/n "high level" and "getting into the weeds"

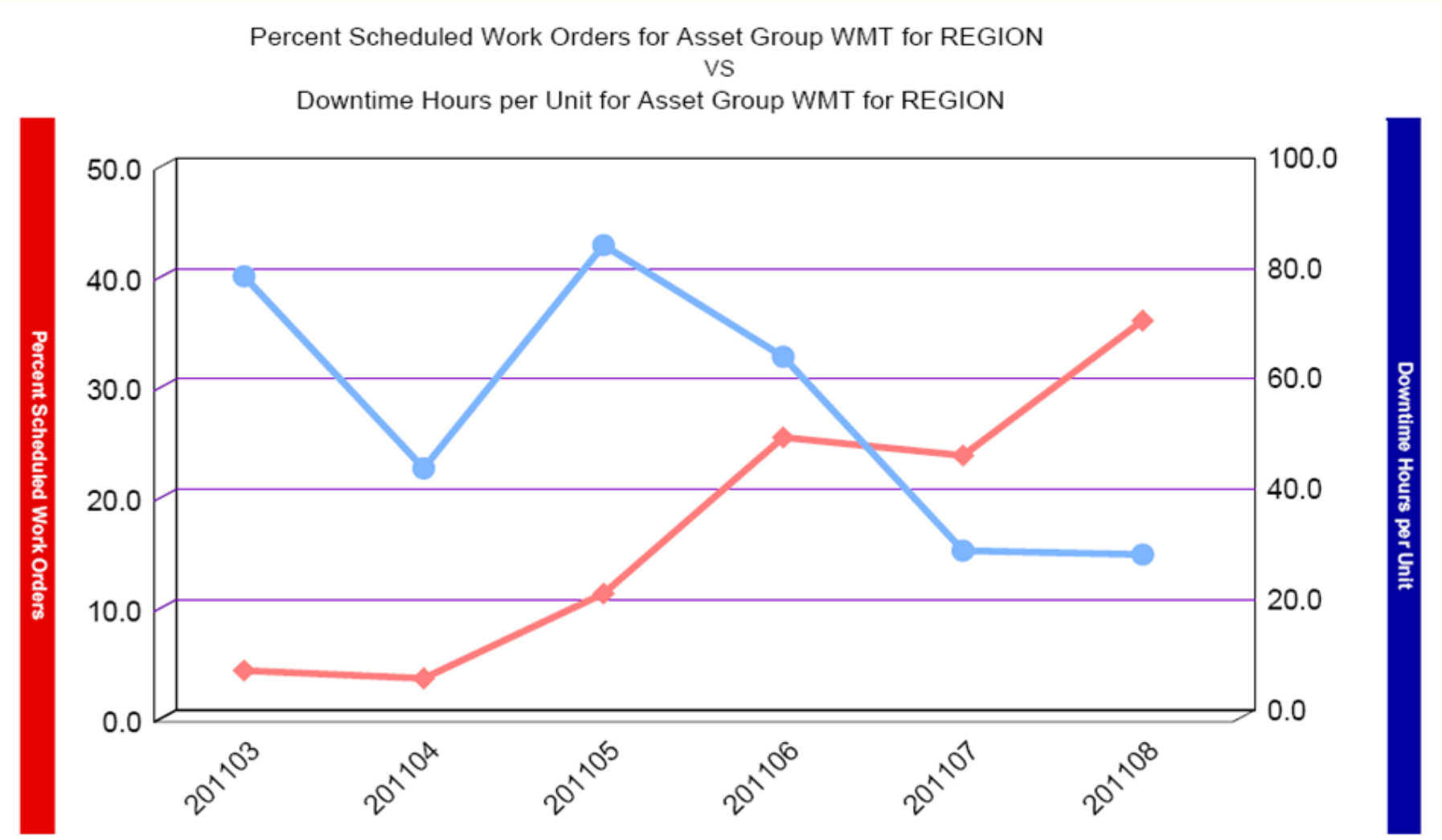
Reporting Metrics

- Transaction reporting
- Ad-hoc reporting
- Replacement modeling
- **Trend analysis**
- **Dashboards**
- **Key performance/result indicators**

Trend Analysis

- Ratios of key maintenance data
- Measure maintenance factors over a set time frame
- Graphs with ability to drill down to detail

Trend Analysis



DEC JAN FEB MAR APR MAY

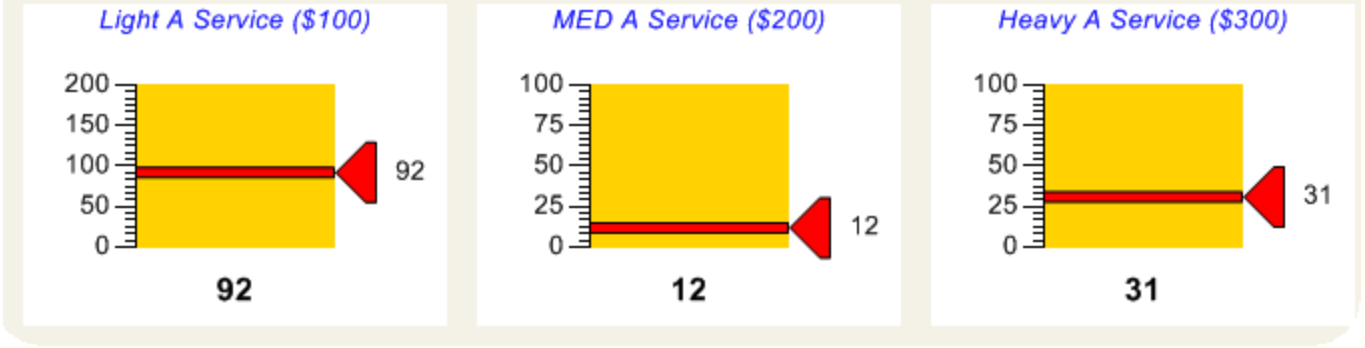
Dashboards

- Near real time data
- Allows for management by exception
- Can act when "pre-defined trigger" occurs
- Do not replace the need for reports, but can reduce reports

Dashboards

PM COSTS	Light A Service ($100)	92
	MED A Service ($200)	12
	Heavy A Service ($300)	31

Name: PM COSTS



WO_NO	SERVICE_PERFORMED	WO_USER_CREATE	OPEN_DT	UNIT_NO
19656	38-PRM-PMA	DAVISJOH	03/25/2011	034402
19661	38-PRM-PMA	DAVISJOH	03/17/2011	034406
20756	38-PRM-PMA	TANISR	04/27/2011	034597

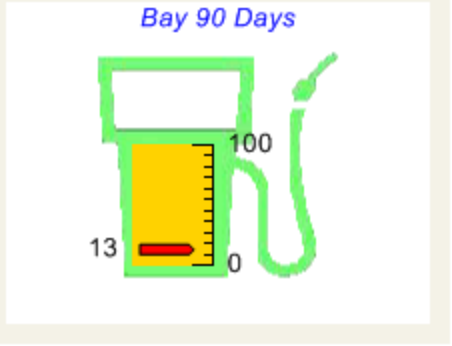
Dashboard Detail

IN-HOUSE_LABOR_COST	IN-HOUSE_PART_COST	OUTSOURCED_COST	TOTAL_JOB_COST
$92.30	$31.29	$.00	$123.59
$92.30	$18.85	$.00	$111.15
$92.30	$18.85	$.00	$111.15
$92.30	$17.93	$.00	$110.23
$90.22	$16.90	$.00	$107.12
$.00	$.00	$100.98	$100.98

Dashboards

NO FUEL	Bay 90 Days	13

Name: NO FUEL

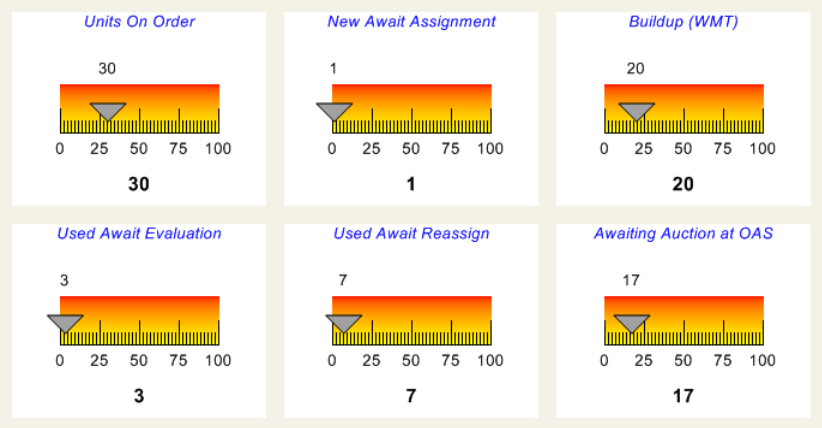


Dashboard Summary:

UNIT_NO	LAST_FUEL	UNIT_DESC
042002	2012/02/01	1989 International 4900 6x4 Crane
041541	2012/02/24	2001 IH 2574 4X2 DUMP
041595	2012/03/01	2004 INTERNATIONAL 7600 6X4 S.T. TANDEM

Dashboards

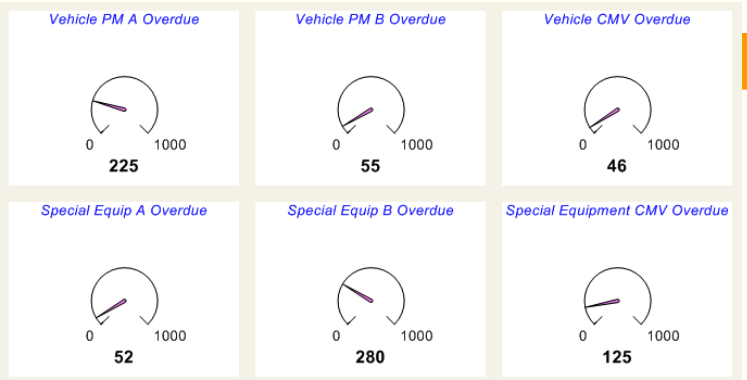
UNIT STATUS		
	Units On Order	30
	New Await Assignment	1
	Buildup (WMT)	20
	Used Await Evaluation	3
	Used Await Reassign	7
	Awaiting Auction at OAS	17



Unit_No	Year	Make	Model
034142	2001	DODGE	BR2L62
034145	2001	DODGE	BR2L62

Dashboards

PM OVERDUE	Vehicle PM A Overdue	225
	Vehicle PM B Overdue	55
	Vehicle CMV Overdue	46
	Special Equip A Overdue	52
	Special Equip B Overdue	280
	Special Equipment CMV Overdue	125



REGION	UNIT_NO	CATEGORY_CLASS
BAY	030064	M
BAY	030083	M
BAY	030099	M

Key Performance/Result Indicators

- **Retention**
- **Utilization**
- **Preventive Maintenance (PM) Compliance**
- **Fleet Availability/Downtime**
- Work orders open greater than 60 days
- No Fuel Usage/Rejected fuel meters
- Scheduled vs. Non-scheduled repairs
- M5 work order hours vs. DCDS labor hours

SURVEY

- **Does your state use performance metrics for vehicles and equipment?**
  - 83% of States use metrics
- **If Yes, what would you consider the top 3 fleet metrics?**
  - Downtime – 19%
  - Utilization – 19%
  - Retention – 15%
  - PM Compliance – 14%
- **What are the top three fleet metrics for comparison at the national level?**
  - Same as above
- **What fleet management system does your state use to capture data for fleet metrics?**

MIDWEST/NORTHEAST

- Midwest/Northeast States developed Briefings/Issue Statements in support of four recommended metrics

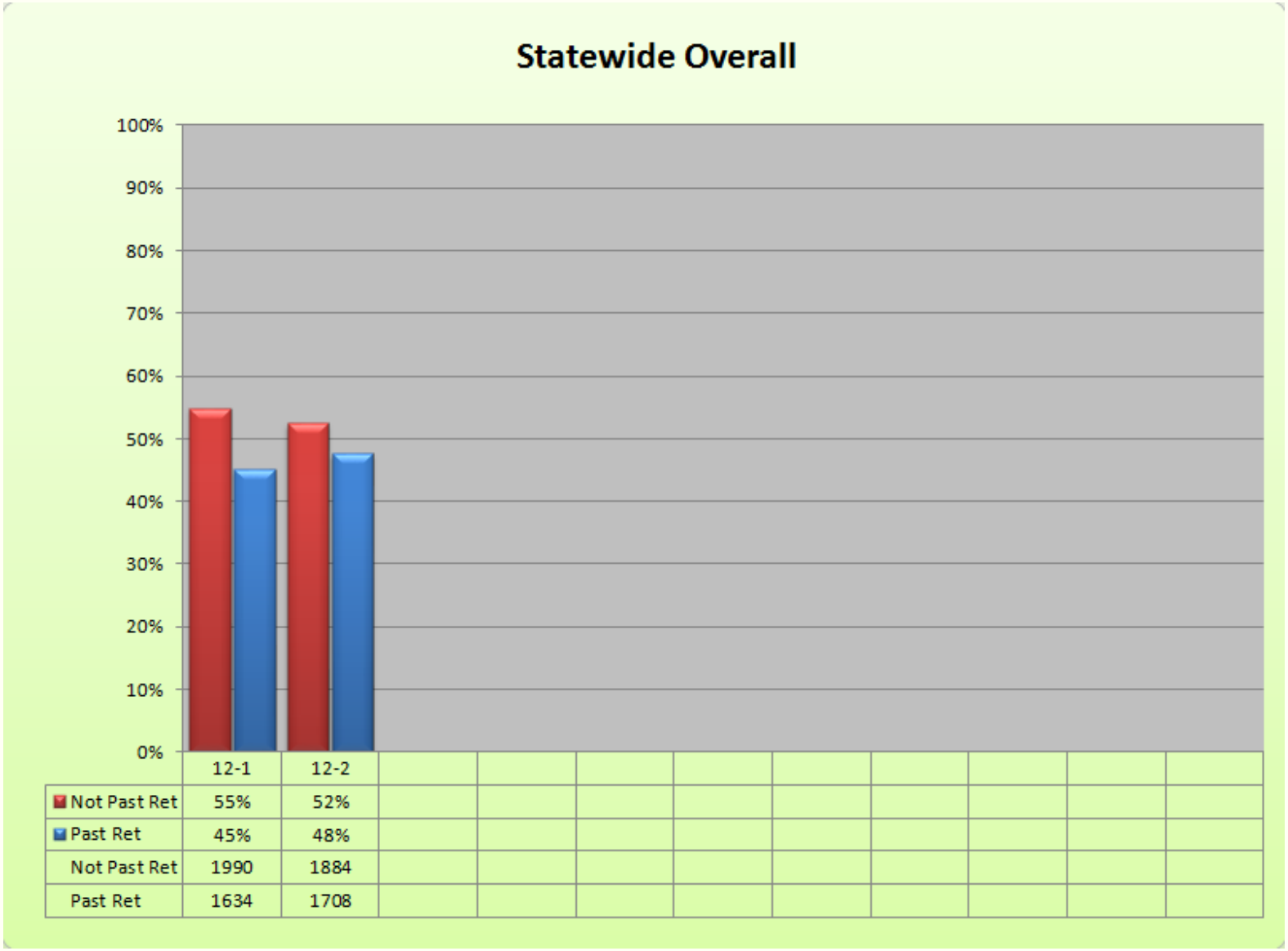
- Midwest – Utilization and Availability/Downtime
  - Michigan
  - Kansas
  - Minnesota
  - Indiana

- Northeast – Preventive Maintenance and Retention
  - Pennsylvania
  - Maine
  - Delaware

RETENTION

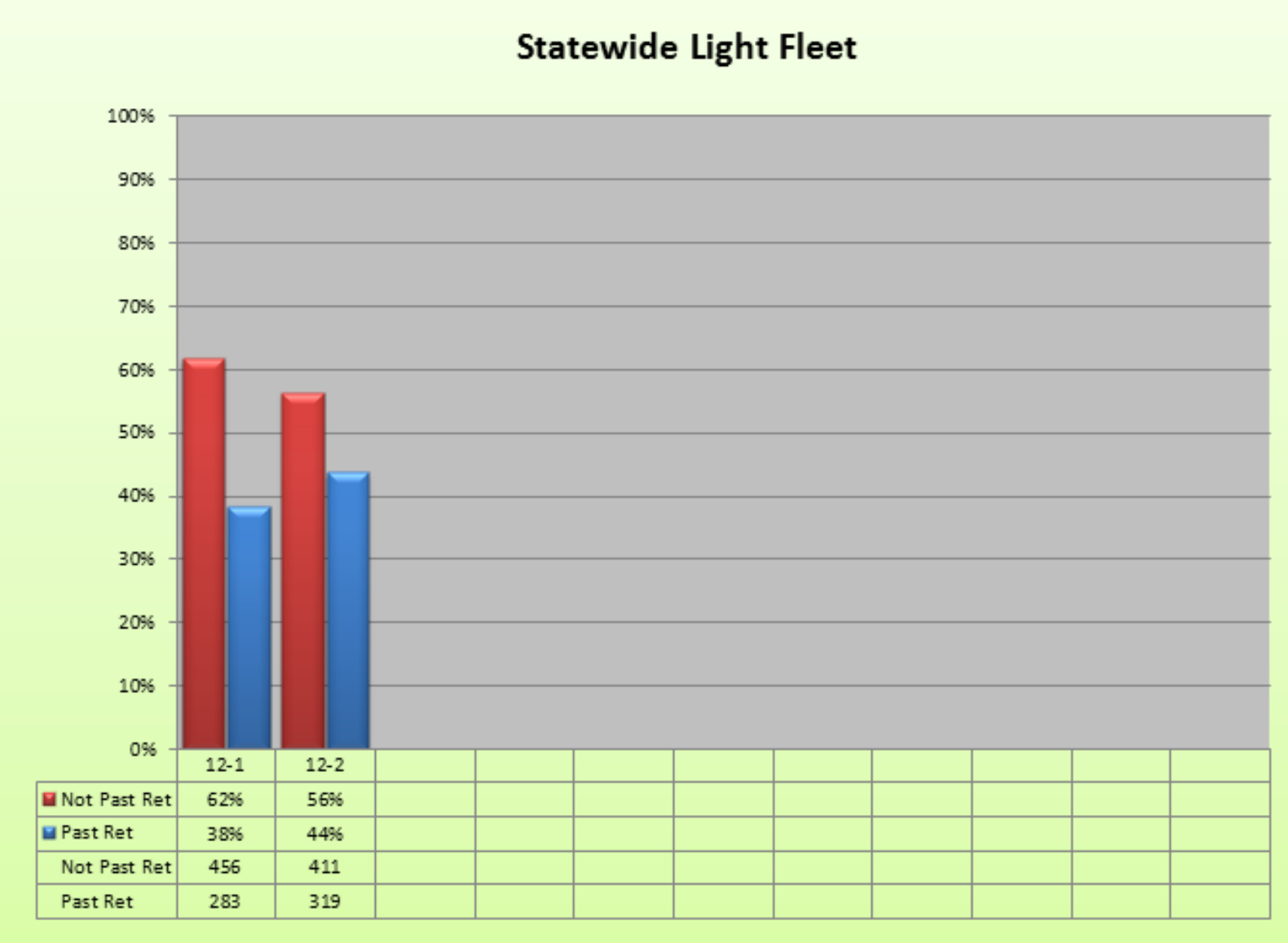
- Based upon existing department criteria (months)
- Six Categories
  - Light Fleet Vehicles
  - Medium Fleet Vehicles
  - Heavy Fleet Vehicles
  - Winter Maintenance Truck Vehicles (WMTs)
  - Special Equipment
  - Overall
- Reported every quarter
- Pass/Fail Criteria
- Includes only permanent units

RETENTION - STATEWIDE



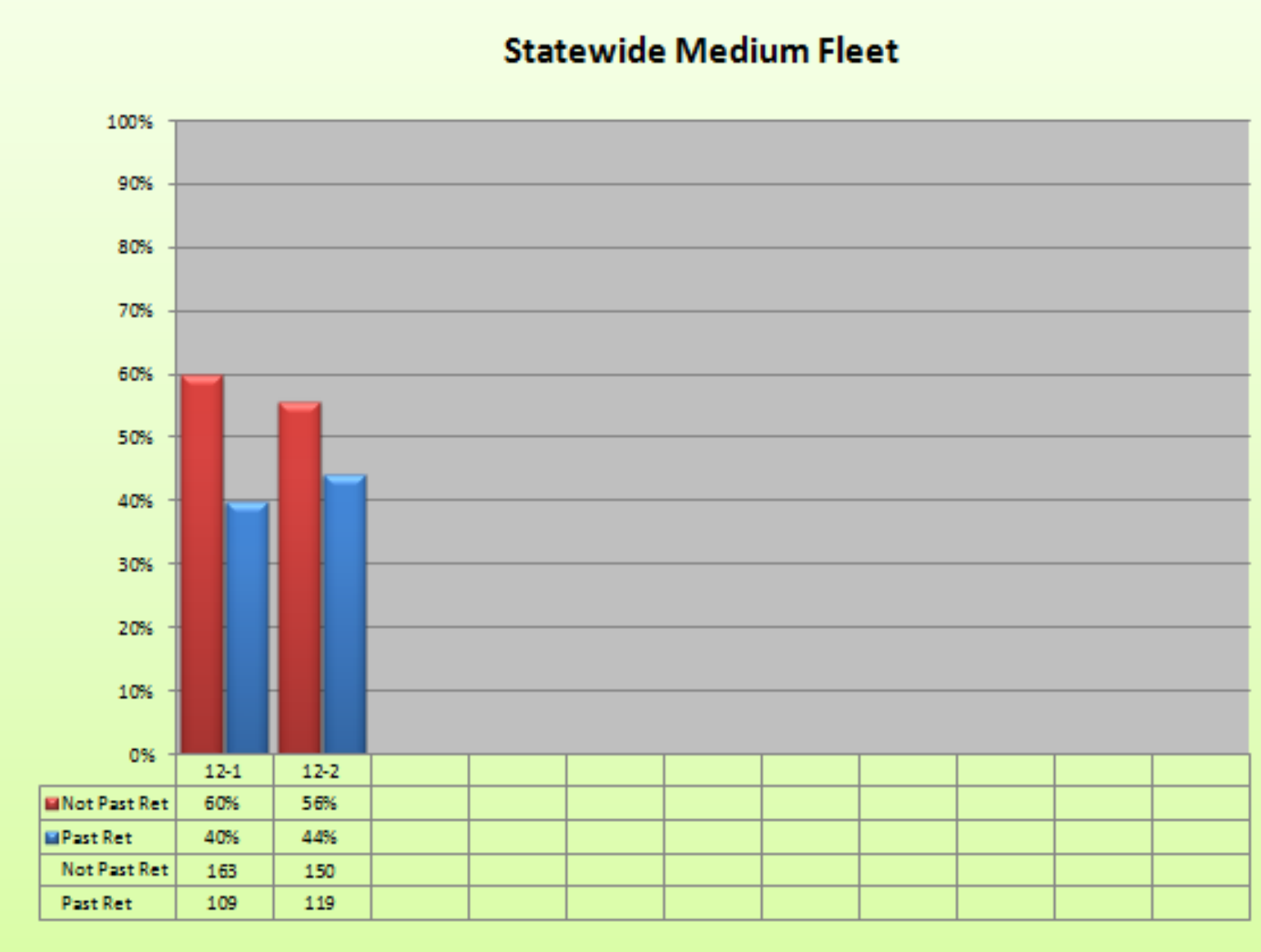
	12-1	12-2
Not Past Ret	55%	52%
Past Ret	45%	48%
Not Past Ret	1990	1884
Past Ret	1634	1708

RETENTION – LIGHT



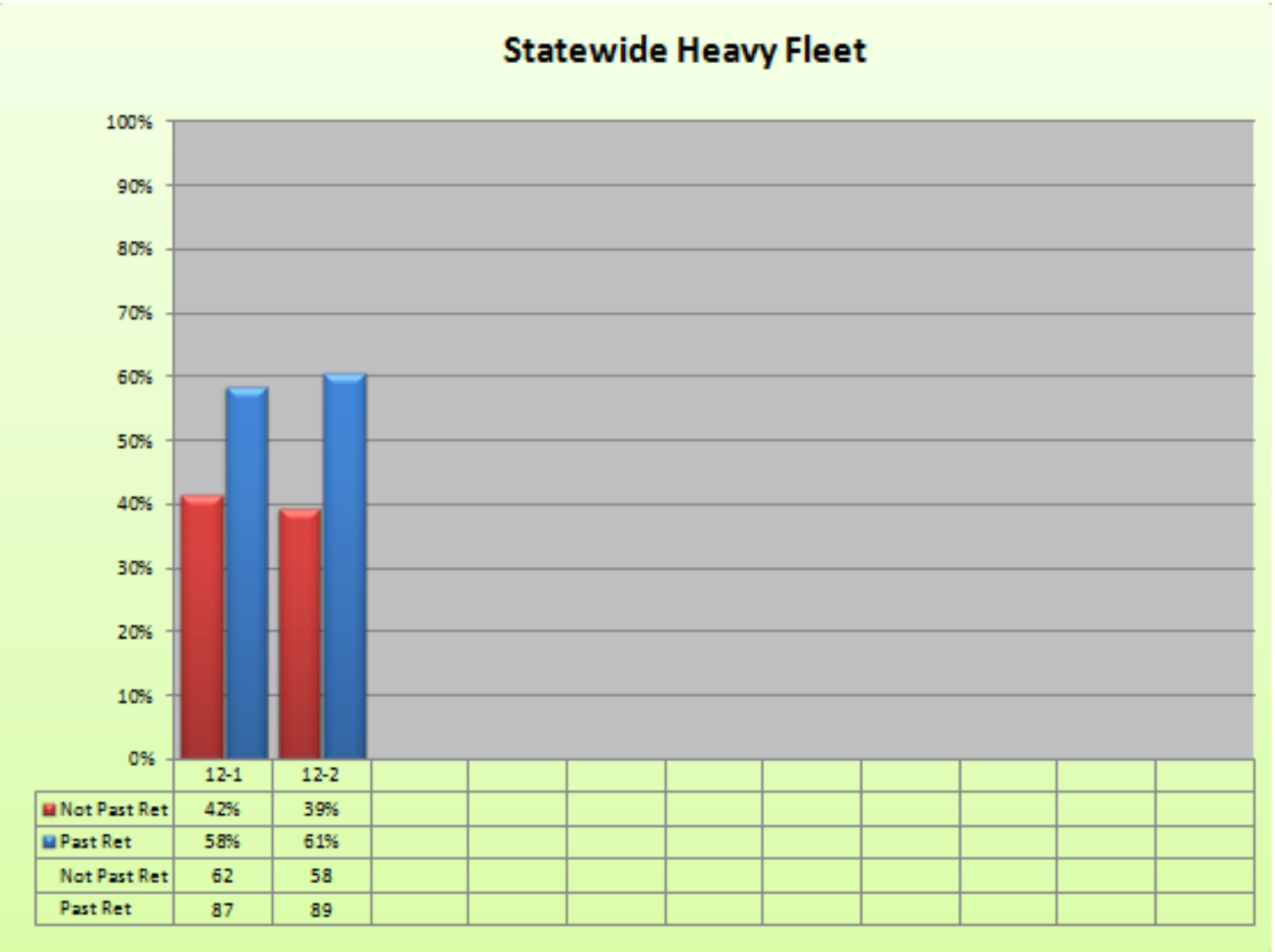
	12-1	12-2
Not Past Ret	62%	56%
Past Ret	38%	44%
Not Past Ret	456	411
Past Ret	283	319

RETENTION - MEDIUM



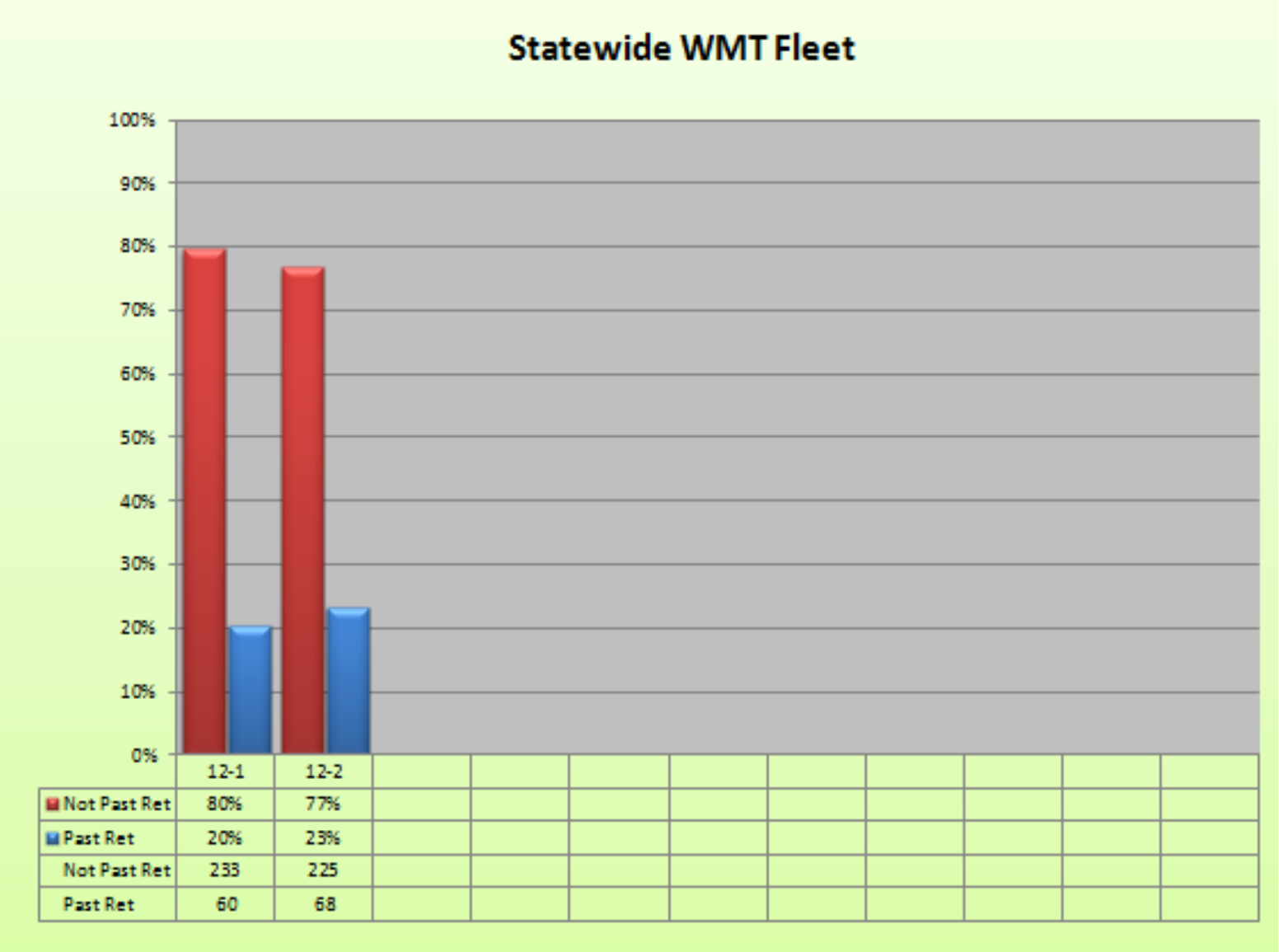
	12-1	12-2
Not Past Ret	60%	56%
Past Ret	40%	44%
Not Past Ret	163	150
Past Ret	109	119

RETENTION - HEAVY



	12-1	12-2
Not Past Ret	42%	39%
Past Ret	58%	61%
Not Past Ret	62	58
Past Ret	87	89

RETENTION - WMT



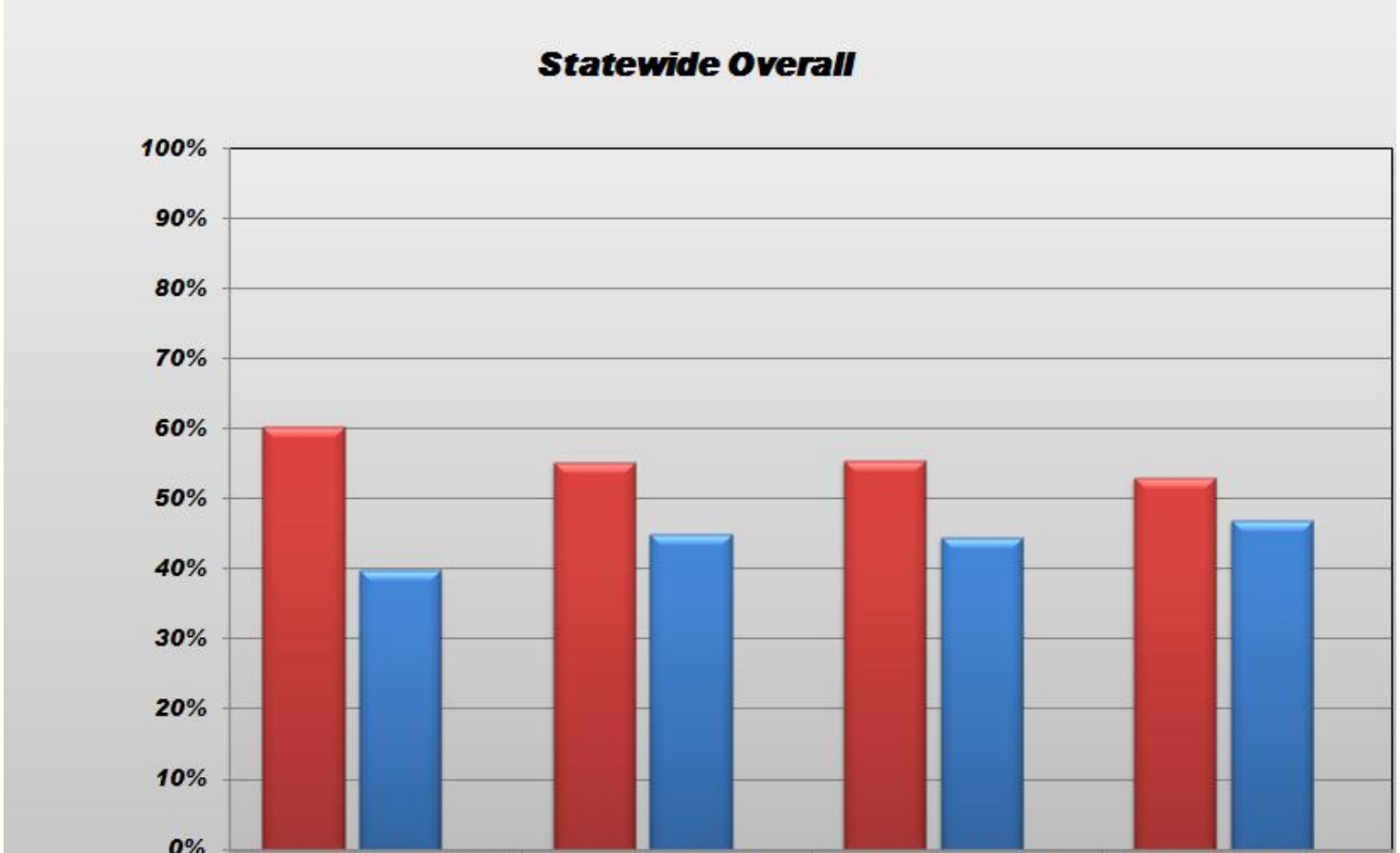
RETENTION – SPECIAL EQUIPMENT

	12-1	12-2
Not Past Ret	50%	48%
Past Ret	50%	52%
Not Past Ret	1076	1040
Past Ret	1095	1113

UTILIZATION

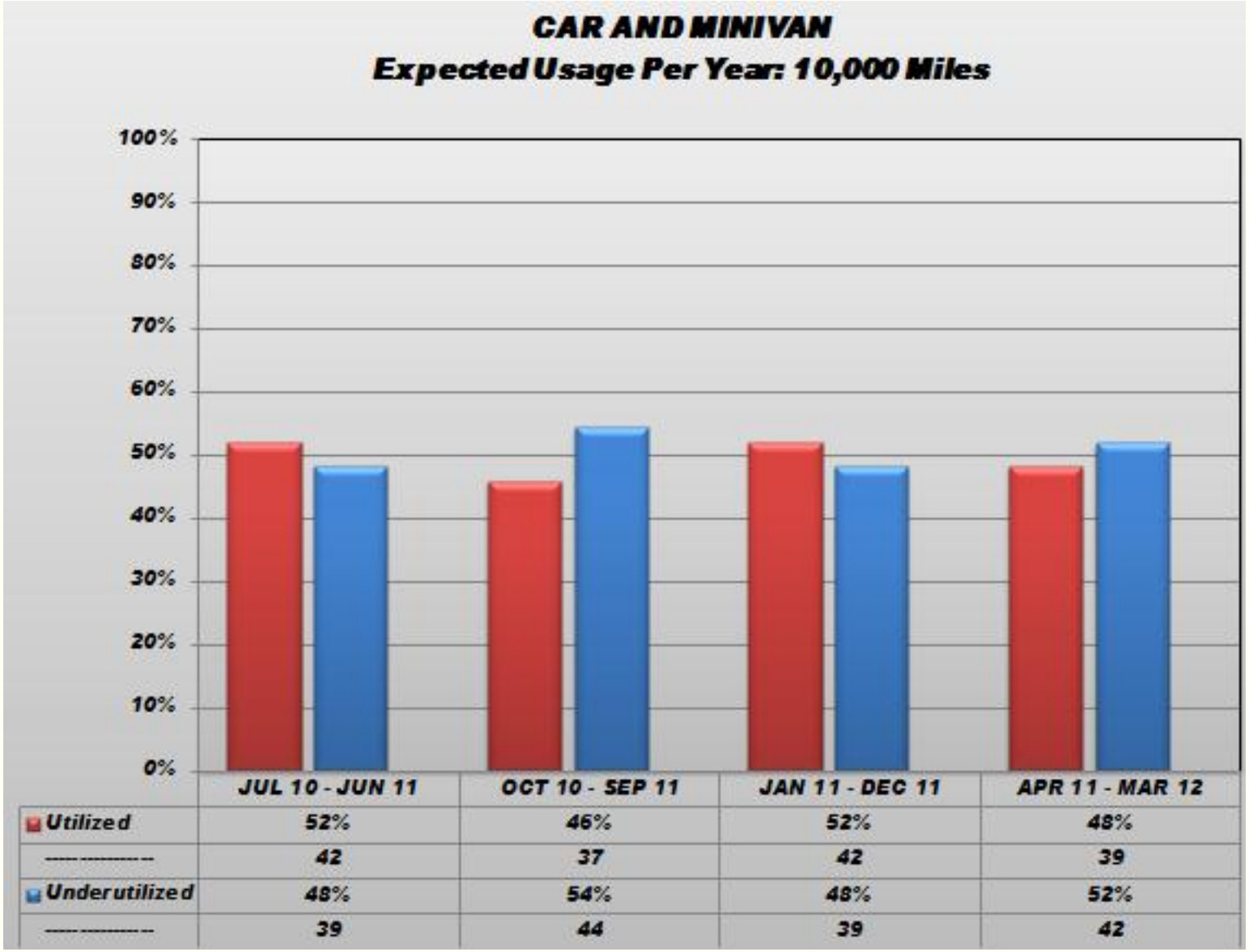
- Based upon recently established criteria
- Six Categories
  - Mini-van & Car: 10,000 Miles Per Year
  - Light Fleet Trucks: 360 Engine Hours Per Year (12,000 Miles)
  - Medium Fleet Trucks: 360 Engine Hours Per Year (12,000 Miles)
  - Heavy Fleet Trucks: 300 Engine Hours Per Year (10,000 Miles)
  - WMTs: 300 Engine Hours Per Year (10,000 Miles)
  - Overall
- Pass/Fail criteria
- Reported quarterly
- Always capture a 12-month period
- Only permanent units
- Special equipment reporting methodology different

UTILIZATION - STATEWIDE



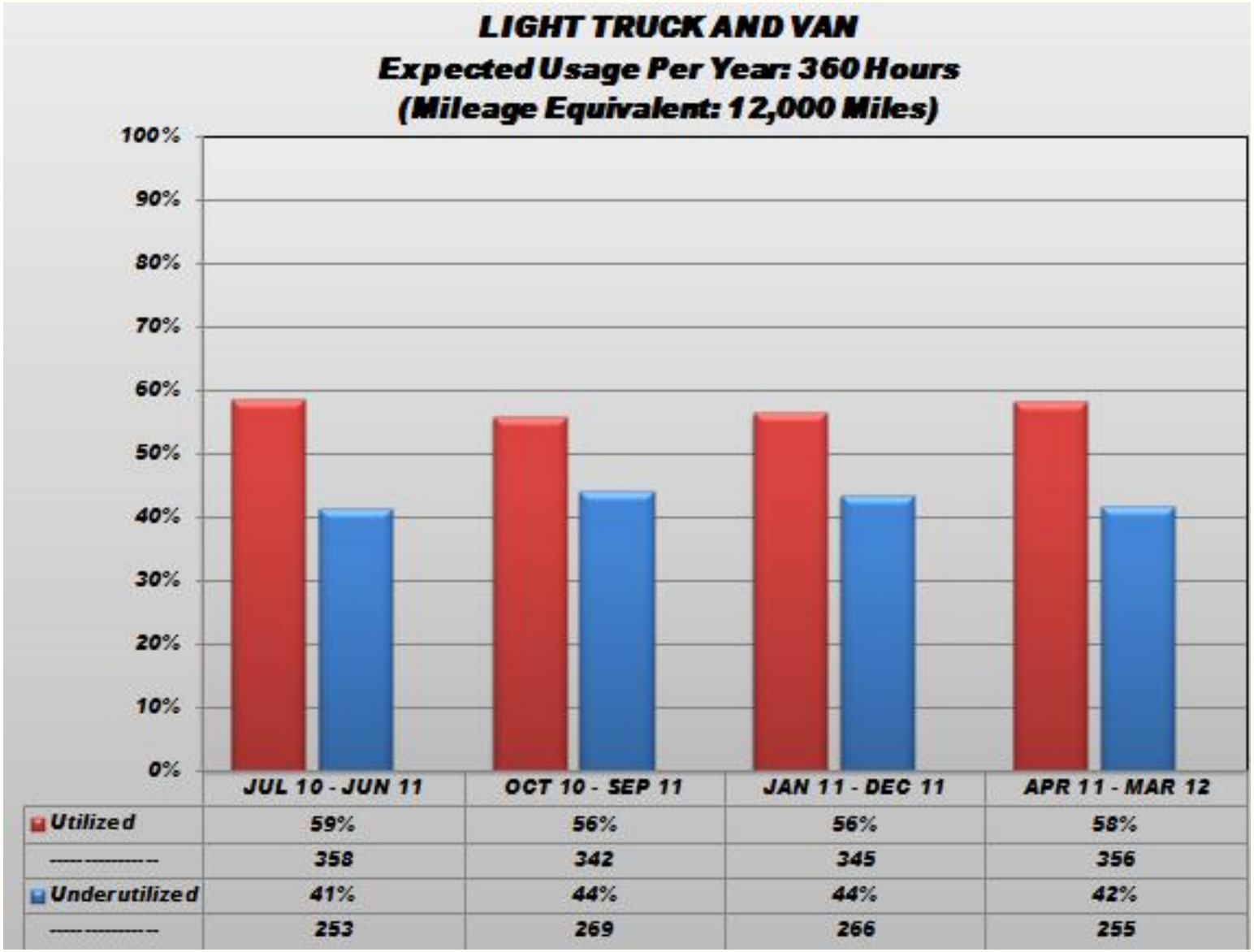
	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	60%	55%	55%	53%
----------	824	758	768	741
Underutilized	40%	45%	45%	47%
----------	543	616	617	655

UTILIZATION – MINI-VAN & CAR



	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	52%	46%	52%	48%
----------	42	37	42	39
Underutilized	48%	54%	48%	52%
----------	39	44	39	42

UTILIZATION - LIGHT

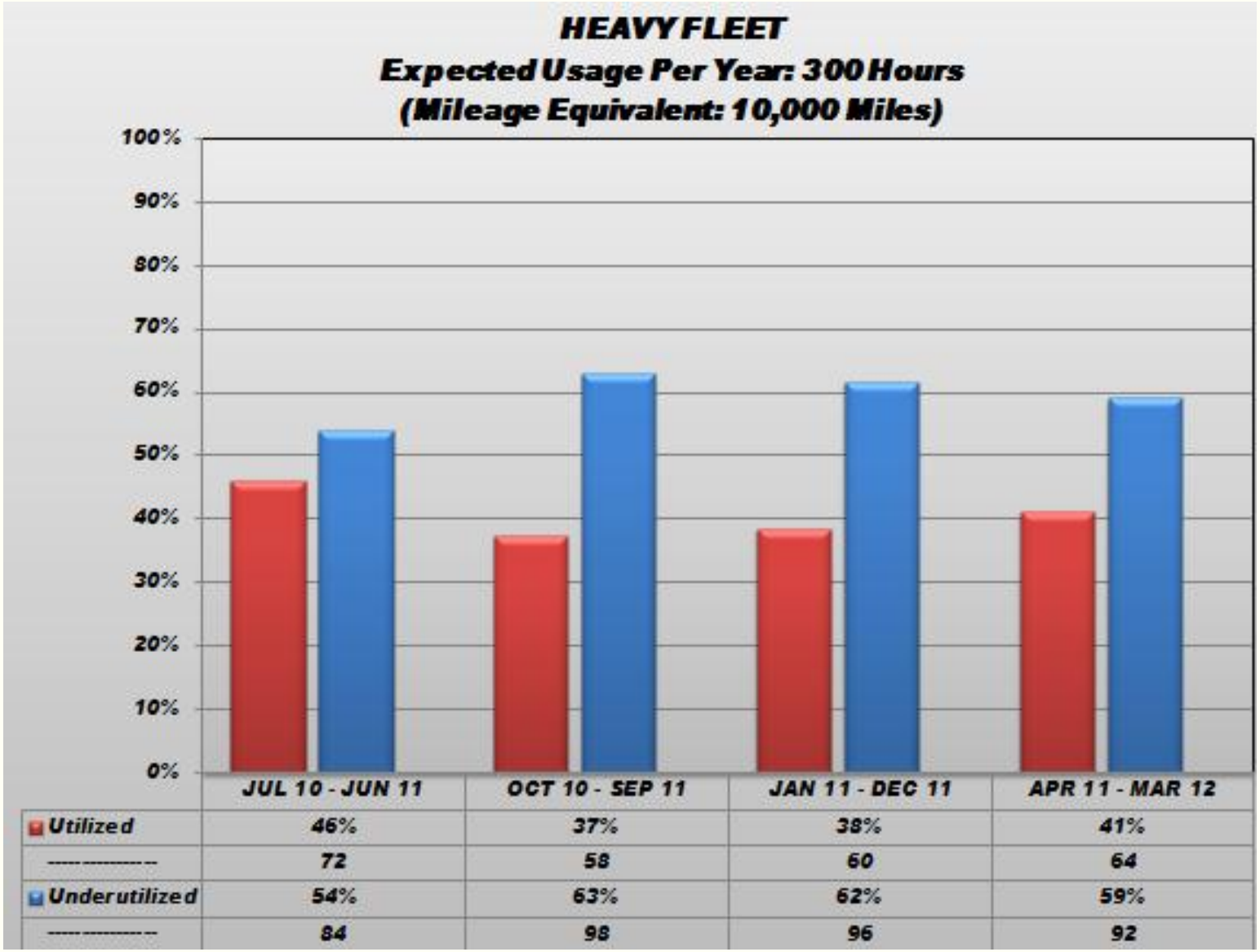


	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	59%	56%	56%	58%
----------	358	342	345	356
Underutilized	41%	44%	44%	42%
----------	253	269	266	255

UTILIZATION - MEDIUM

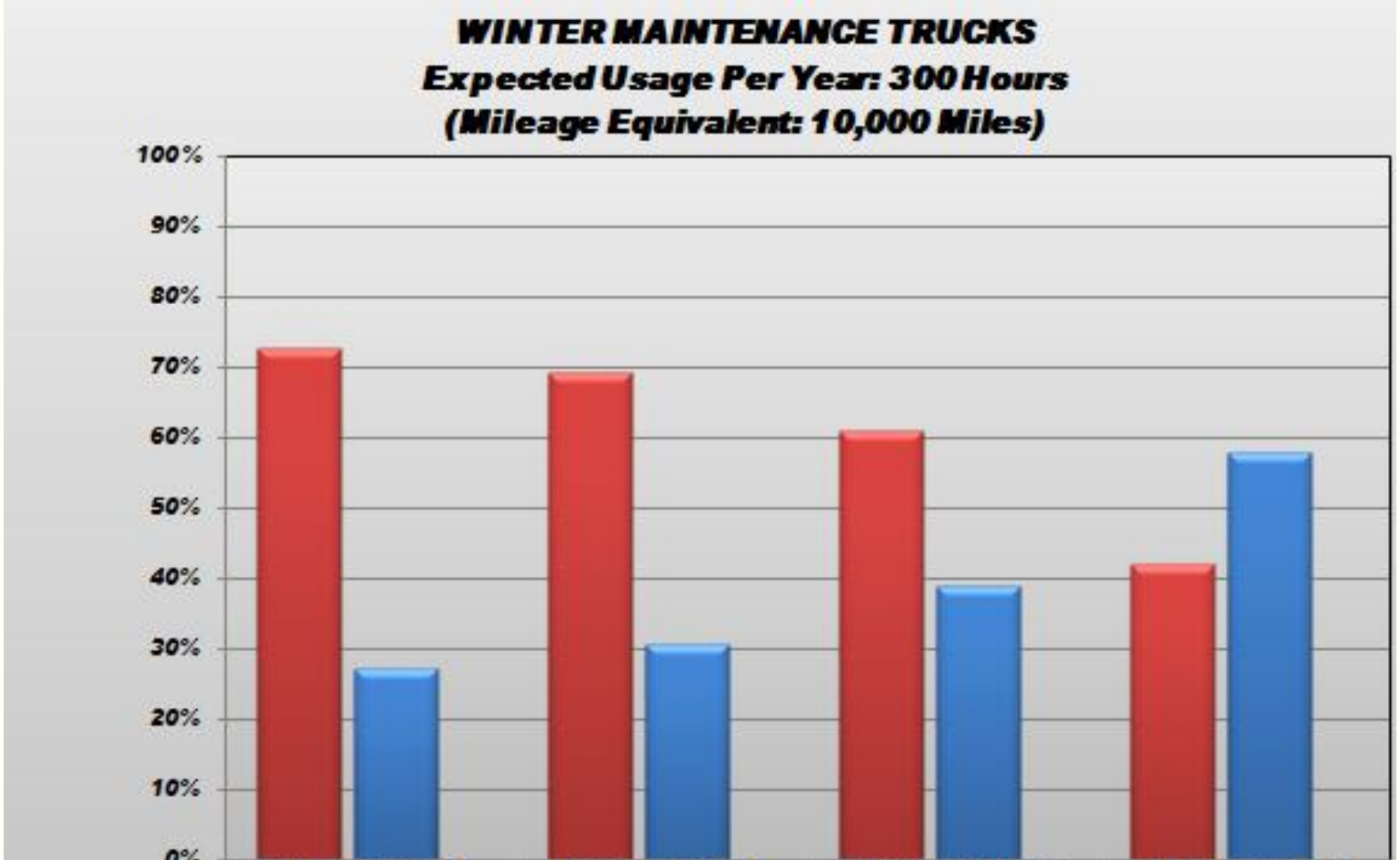
	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	63%	52%	59%	62%
----------	162	135	151	160
Underutilized	37%	48%	41%	38%
----------	96	123	107	98

UTILIZATION - HEAVY



	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	46%	37%	38%	41%
----------	72	58	60	64
Underutilized	54%	63%	62%	59%
----------	84	98	96	92

UTILIZATION - WMT



	JUL 10 - JUN 11	OCT 10 - SEP 11	JAN 11 - DEC 11	APR 11 - MAR 12
Utilized	73%	69%	61%	42%
----------	190	186	170	122
Underutilized	27%	31%	39%	58%
----------	71	82	109	168

UTILIZATION DETAIL

MINIVAN & CAR	**Expected Usage per Year:** 10,000 Miles
Unit: **037065**	
Apr-11 to Jun-11	**5,293**
Jul-11 to Sep-11	**2,887**
Oct-11 to Dec-11	**2,813**
Jan-12 to Mar-12	**955**
	11,948 

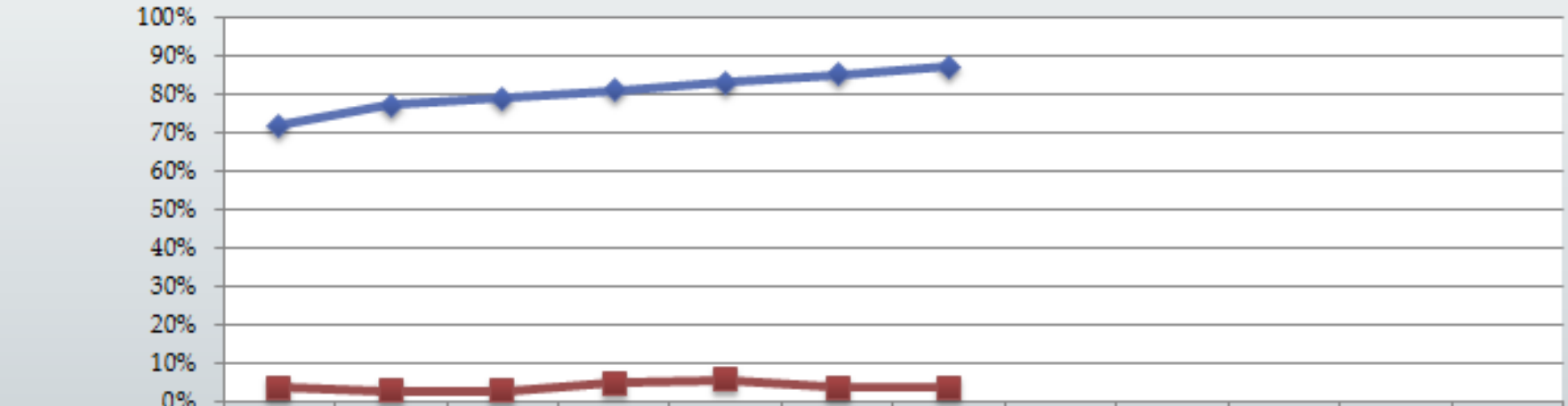
UTILIZATION DETAIL

MINIVAN & CAR	**Expected Usage per Year:** 10,000 Miles
Unit: **037082**	
Apr-11 to Jun-11	**2,278**
Jul-11 to Sep-11	**2,482**
Oct-11 to Dec-11	**1,310**
Jan-12 to Mar-12	**1,045**
	7,115 

Preventive Maintenance (PM) Compliance

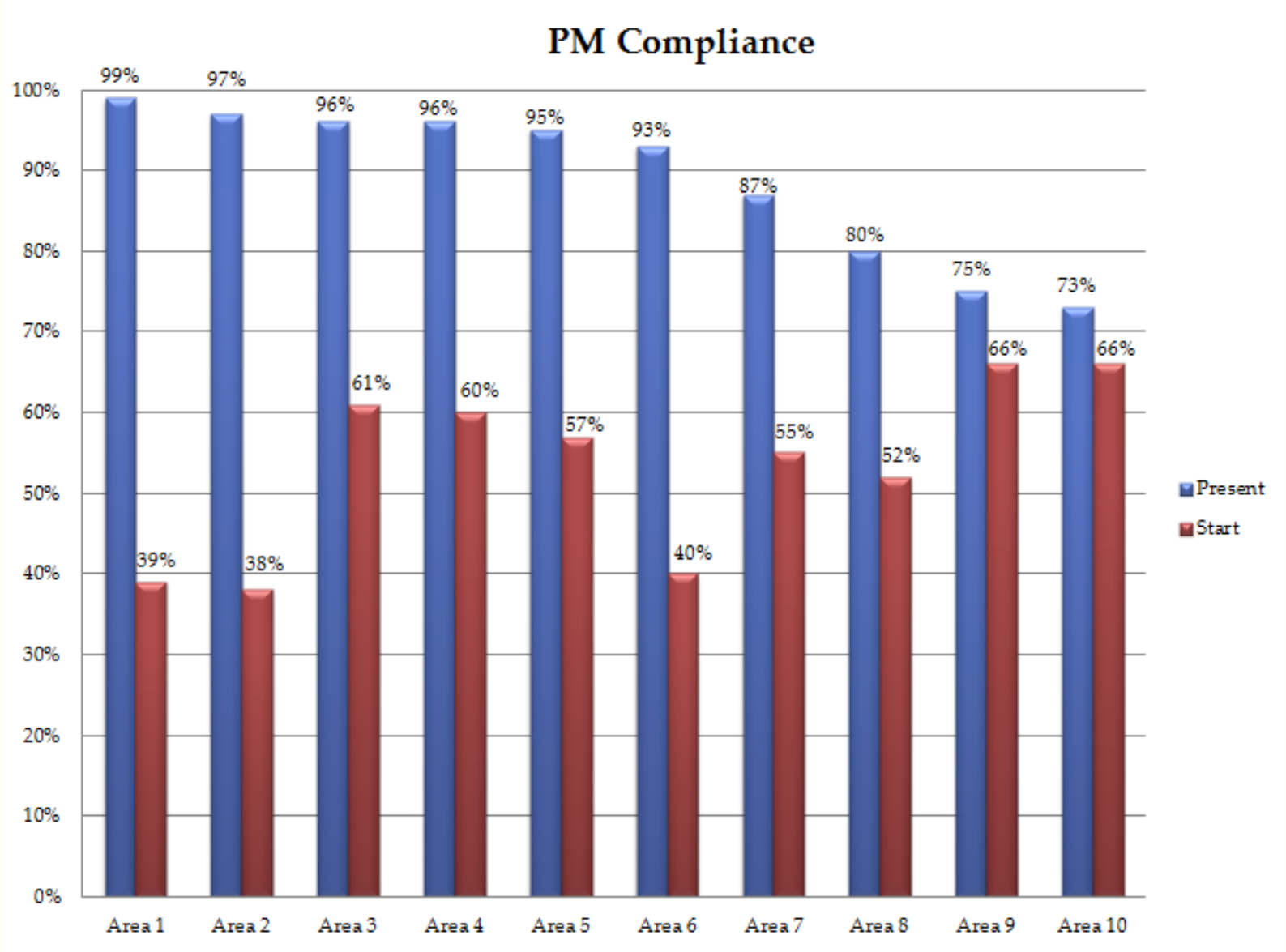
- Indicates PM compliance for vehicles and equipment by job
  - Due = between 90 and 104 percent
  - Overdue = past 105 percent
    - Exceptions: mandated inspections by law such as a commercial motor vehicle inspection, which are due at 100 percent

Preventive Maintenance (PM) Compliance



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
% Compliant	72%	77%	79%	81%	83%	85%	87%					
% Due	4%	3%	3%	5%	6%	4%	4%					

PM COMPLIANCE



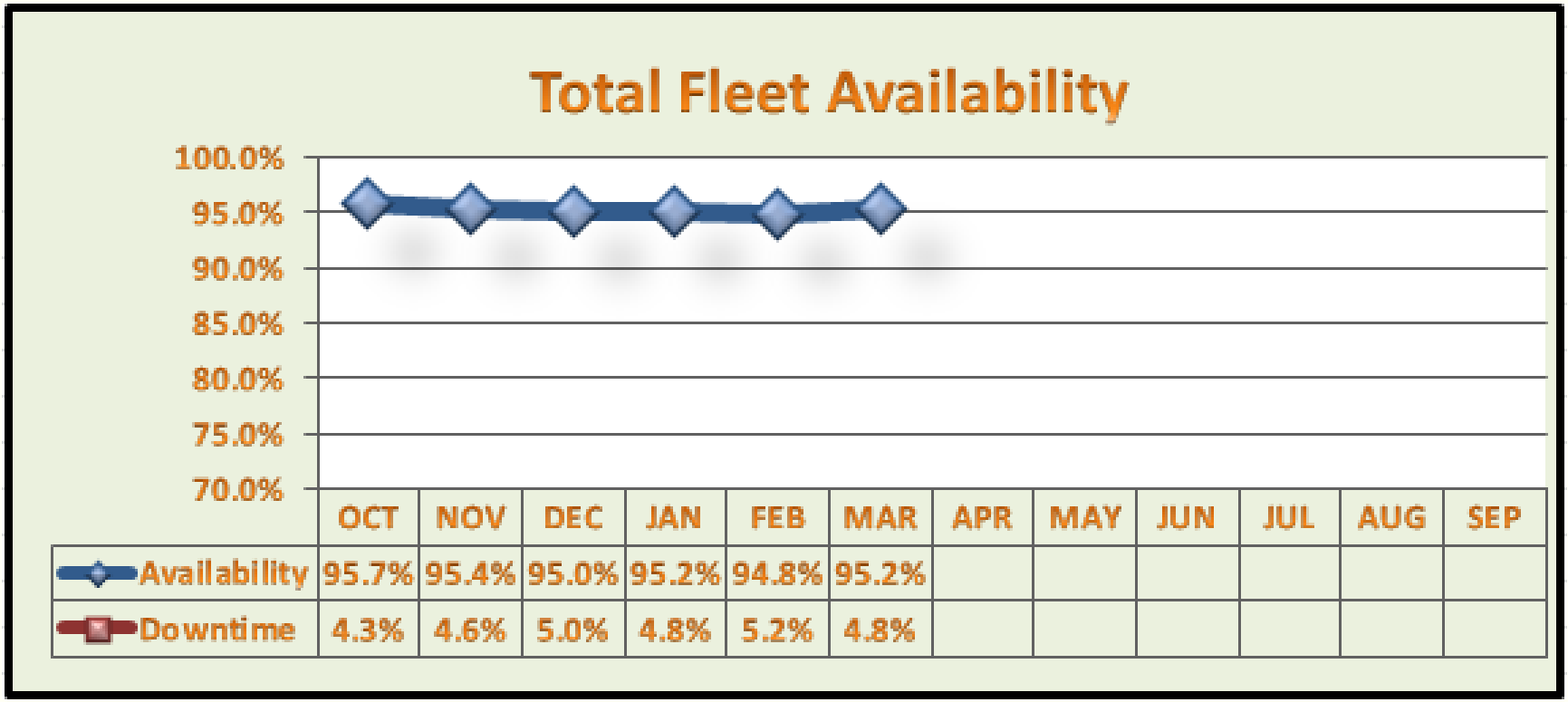
PM Compliance Detail

Job	Last Completed Job			Time Interval			Usage Interval		
	Date	Meter 1	Meter 2	Sched	Next Date	Pct Due	Sched	Next Meter	Pct Due
-									
Unit No: 032006 - 1999 FORD F350				LTD Usage: 5,951.00			LTD Usage2: 114,017.00		
38-PRM-PMA	4/7/2011	5893	110,844.00	365	4/7/2012	**107 %**	200	6093	29%
Unit No: 034754 - 2007 FORD F250				LTD Usage: 4,367.00			LTD Usage2: 191,760.00		
38-PRM-PMA	12/9/2011	4216	191,740.00	365	12/9/2012	40%	150	4366	101%
38-PRM-PMB	10/7/2010	3251	147,101.00				1000	4251	**112 %**

Fleet Availability/Downtime

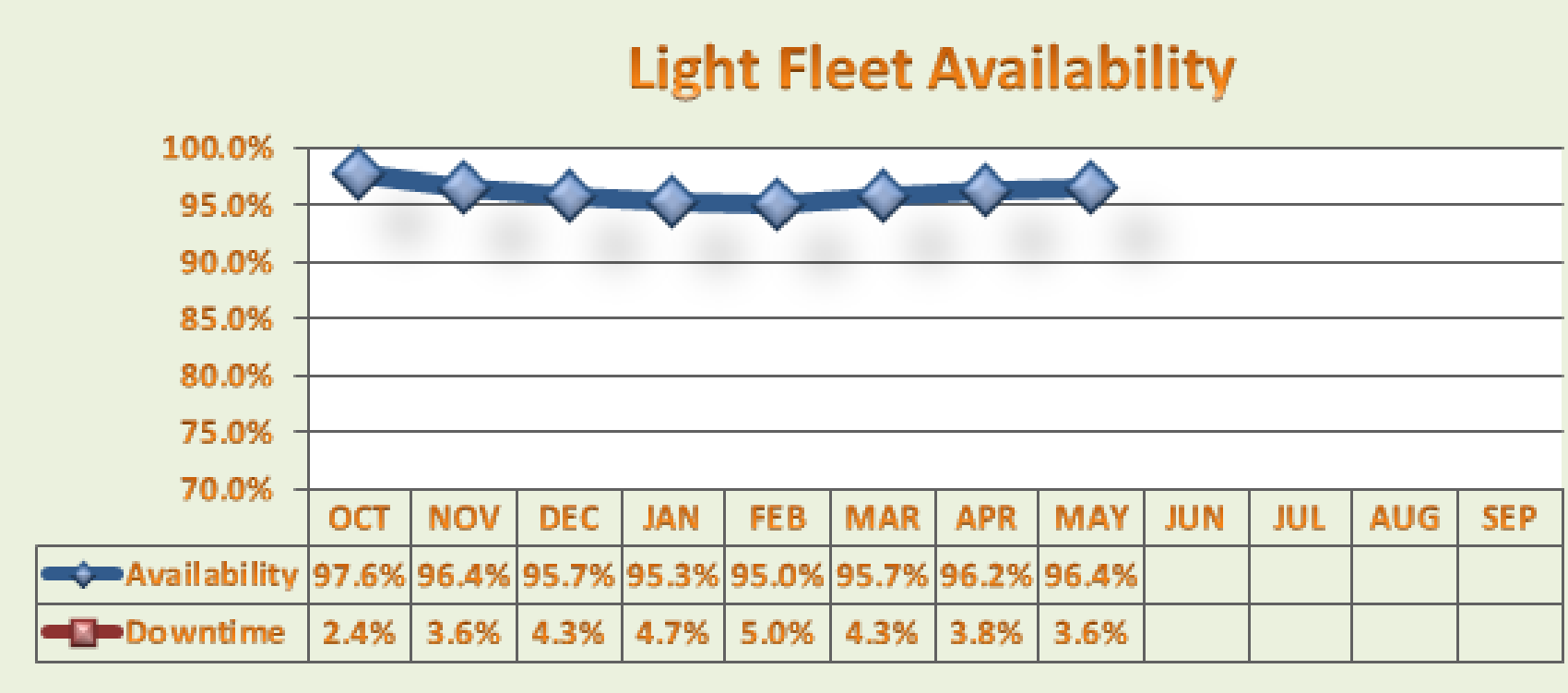
- Periods of time when a unit is available and able to perform its primary function. In order to compute availability, one must be able to measure downtime. **Downtime is measured by the difference between a work order open and close date**.
- Reported monthly
- Six categories
  - Light Fleet Vehicles
  - Medium Fleet Vehicles
  - Heavy Fleet Vehicles
  - WMTs
  - Special Equipment
  - Overall
- All units reported

FLEET AVAILABILITY/DOWNTIME STATEWIDE



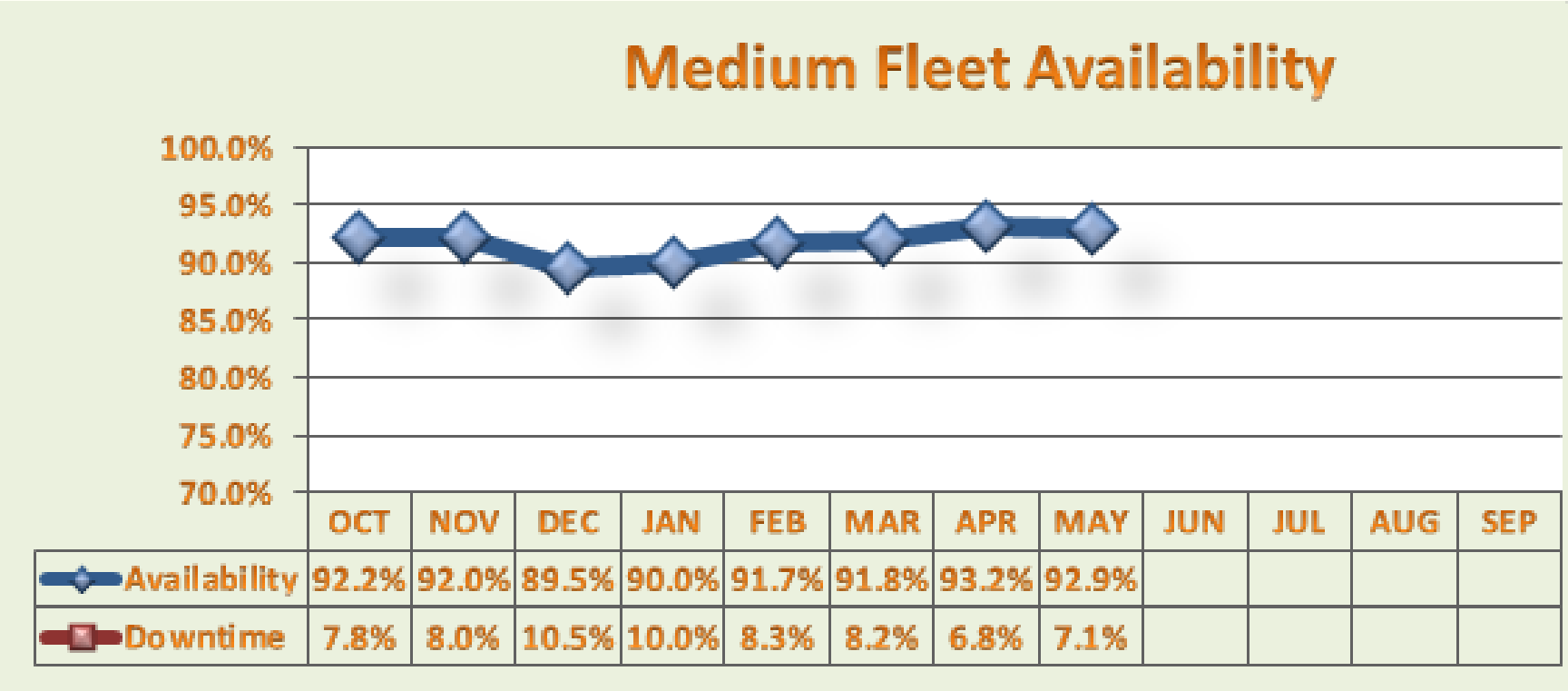
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	95.7%	95.4%	95.0%	95.2%	94.8%	95.2%						
Downtime	4.3%	4.6%	5.0%	4.8%	5.2%	4.8%						

FLEET AVAILABILITY/DOWNTIME LIGHT



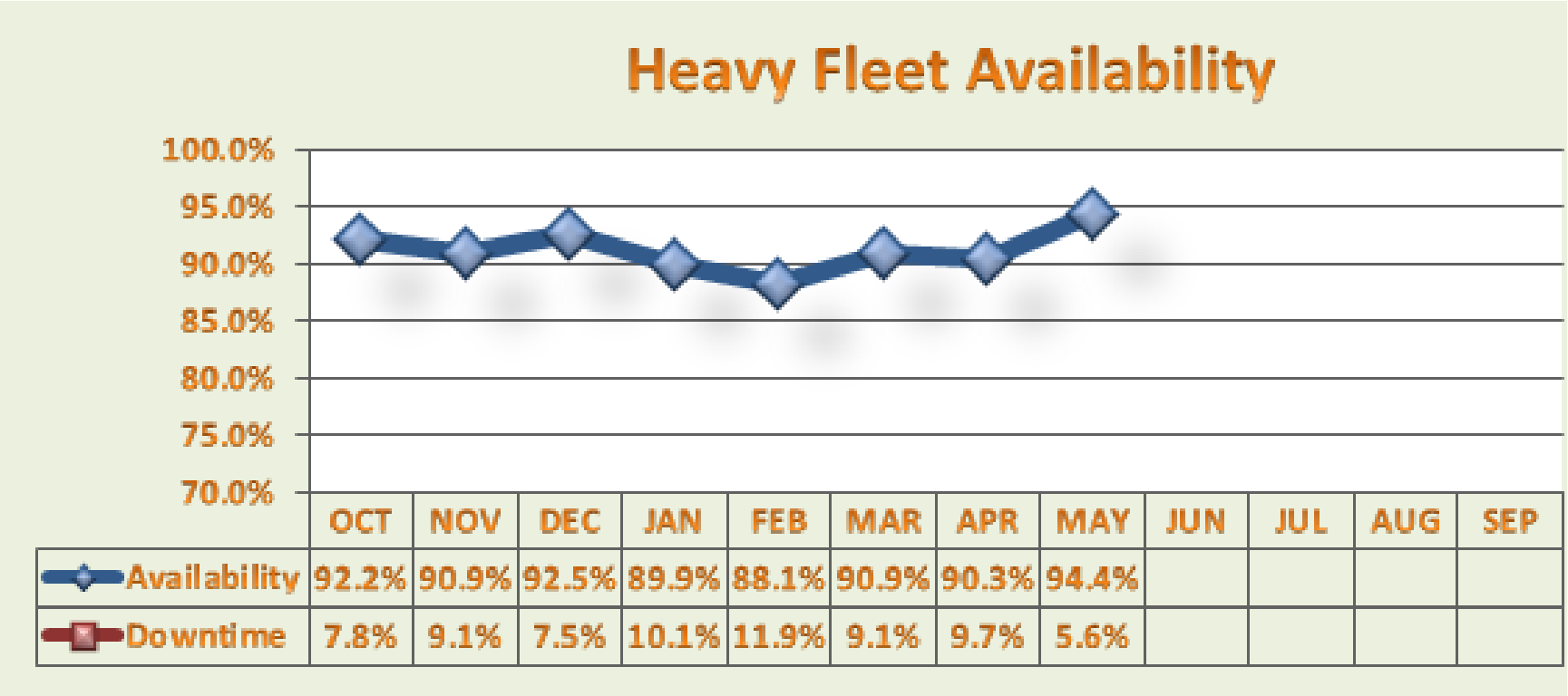
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	97.6%	96.4%	95.7%	95.3%	95.0%	95.7%	96.2%	96.4%				
Downtime	2.4%	3.6%	4.3%	4.7%	5.0%	4.3%	3.8%	3.6%				

FLEET AVAILABILITY/DOWNTIME MEDIUM



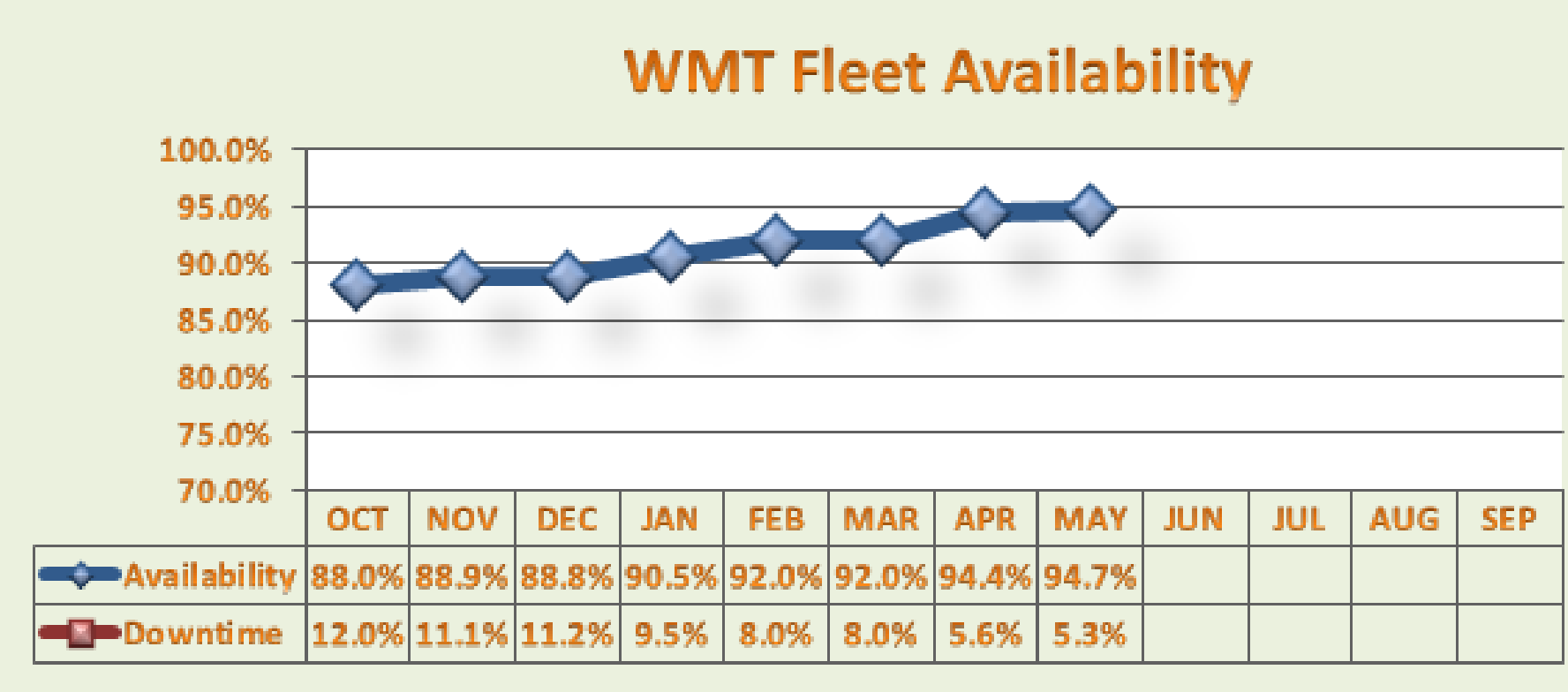
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	92.2%	92.0%	89.5%	90.0%	91.7%	91.8%	93.2%	92.9%				
Downtime	7.8%	8.0%	10.5%	10.0%	8.3%	8.2%	6.8%	7.1%				

FLEET AVAILABILITY/DOWNTIME HEAVY



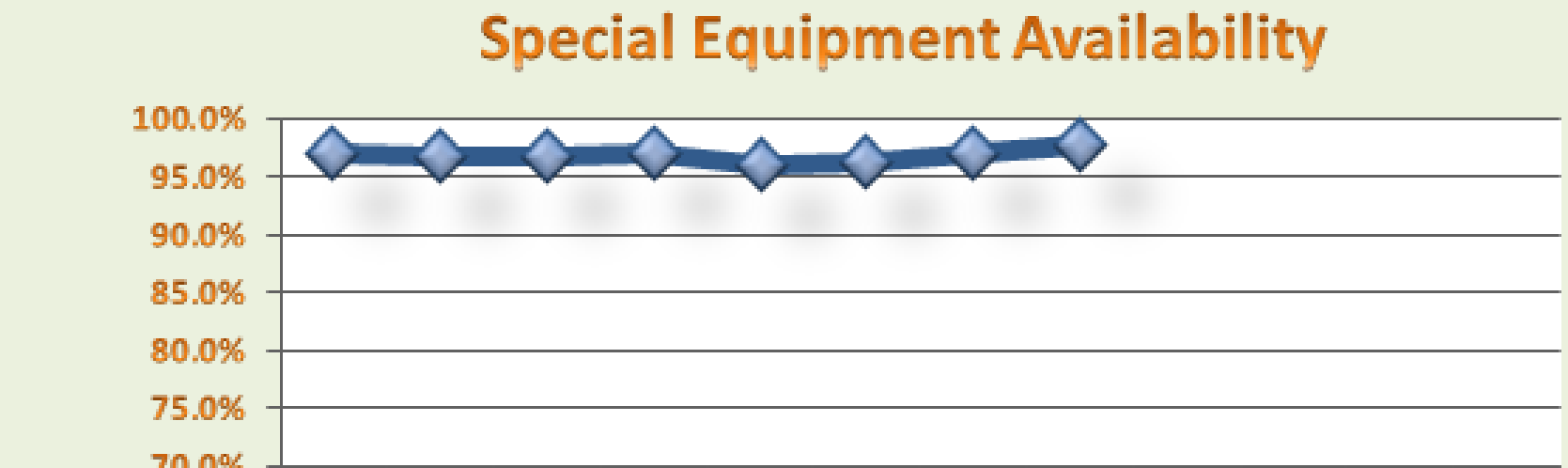
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	92.2%	90.9%	92.5%	89.9%	88.1%	90.9%	90.3%	94.4%				
Downtime	7.8%	9.1%	7.5%	10.1%	11.9%	9.1%	9.7%	5.6%				

FLEET AVAILABILITY/DOWNTIME WMT



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	88.0%	88.9%	88.8%	90.5%	92.0%	92.0%	94.4%	94.7%				
Downtime	12.0%	11.1%	11.2%	9.5%	8.0%	8.0%	5.6%	5.3%				

FLEET AVAILABILITY/DOWNTIME EQUIPMENT



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Availability	96.9%	96.8%	96.6%	96.9%	96.0%	96.3%	96.9%	97.6%				
Downtime	3.1%	3.2%	3.4%	3.1%	4.0%	3.7%	3.1%	2.4%				

Performance Metrics

"All successful organizations keep score. Without the ability to do so, it is impossible for organizations to prove the value of their services to their customers – the residents of the communities they serve."

American Public Works Association
Handbook, September 2002

Questions