NARSA
FLEET &
COOLING SYSTEM MANAGEMENT
SAT. SEPT. 19, 2015
EMBASSY SUITES
BUFFALO, NY

John Dolce, MA
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Chatham Consulting
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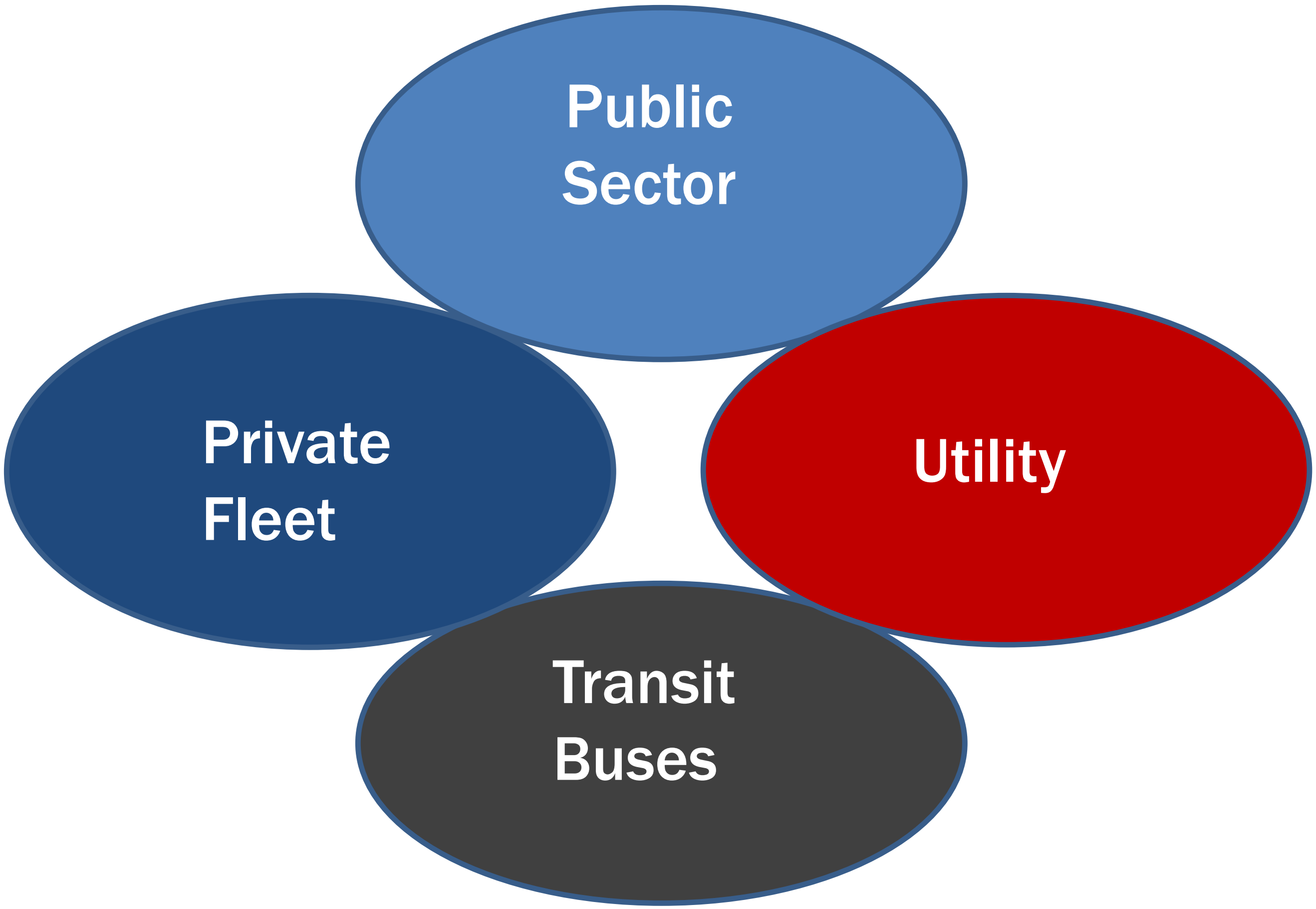
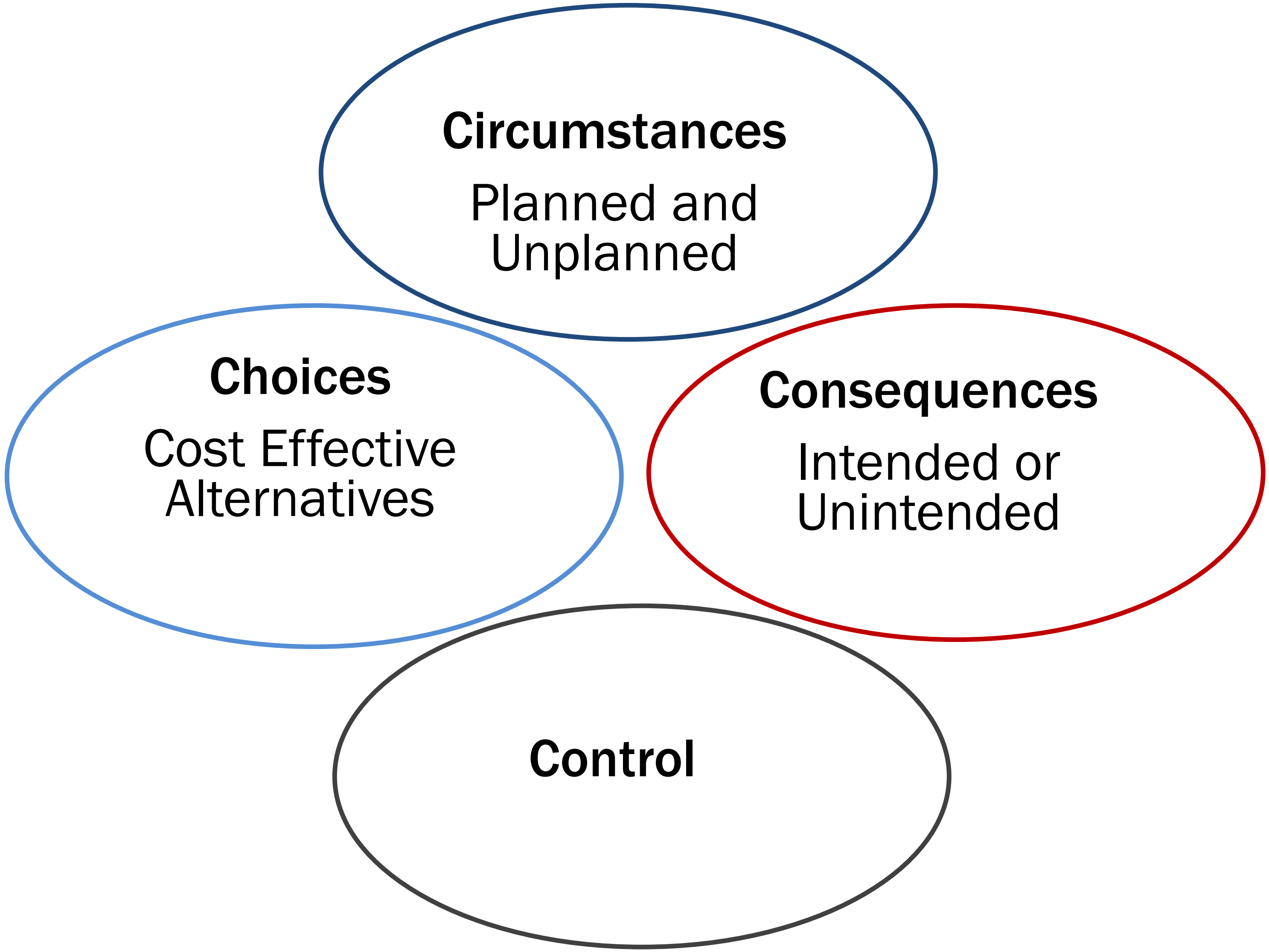
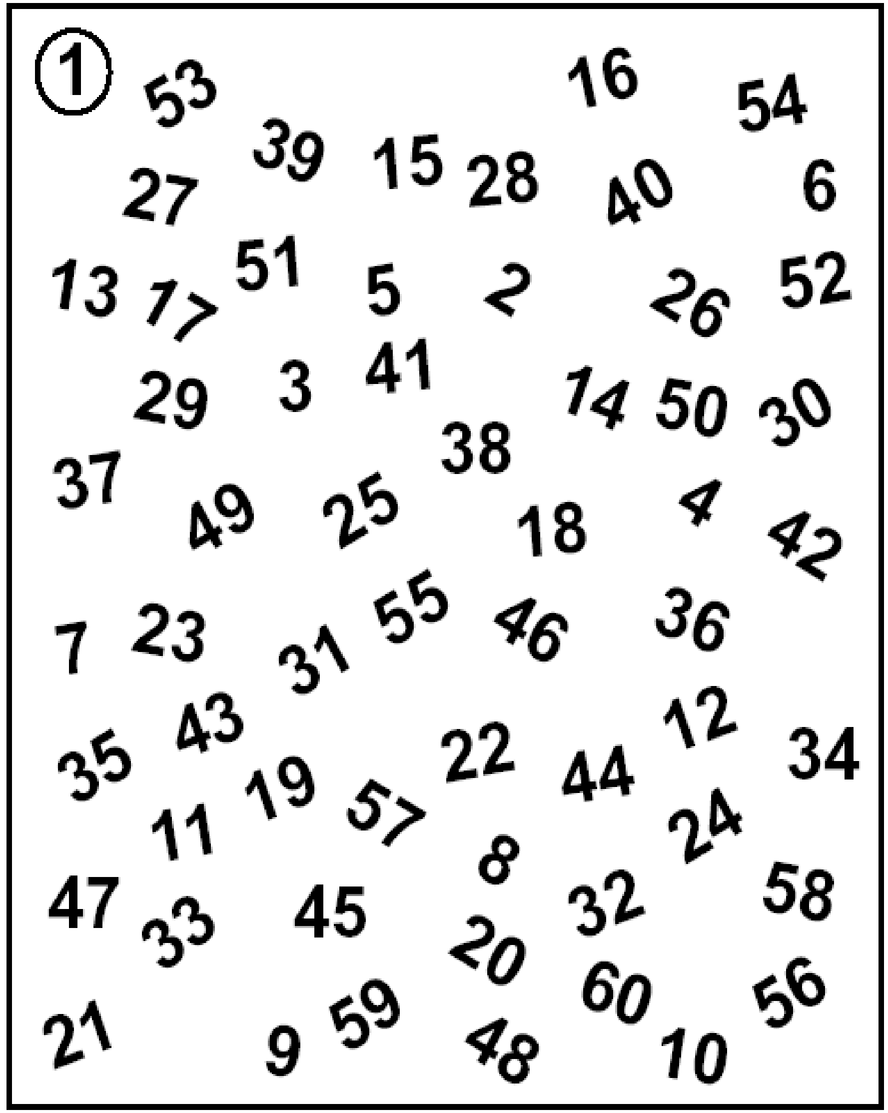
John Dolce Background
Ten Years Fleet Management Experience In Each Area



We Are Impacted By…Circumstances

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FLEET MANAGER

HONEST
FORTHRIGHT
SELF EDUCATED
INTELLIGENT
KNOWLEDGABLE
SMART
APPROACHABLE
PRIORITIZE - SEQUENCE
DECISIVE
DELEGATE
DURABLE
MAINTAIN INTEGRITY

FLEET MANAGER

MEASURE, WATCH & PAY ATTENTION
Measure-Meaningful Events
Watch-Everything
Pay Attention-To What Is Meaningful
Written “POLICY & PROCEDURES”
Daily Events-Prioritized-Sequenced
“MAINTENANCE” & “REPAIR”
Scheduled, Unscheduled Activities
Capital Budgets…Depreciable Assets, Shop, Units
Operating Budgets….Consumables, Fuel, Parts, Labor

Fleet Management Best Practices

- Capital–Operating Strategies-Communicate-Lease-Own
- Policy & Procedures, Dynamic, 25 Written + Attached
- Terms – Definitions – Fleet Speak – Manage
- Daily Down Report – Not available at the end of day
- Repair-Replace-Rebuild-Remove-Rent-Lease-Sell
- Capital Costs-Depreciable Items-Planning
- Operating Costs-Consumables-Planning-Parts
- Cost Management Systems, Budgets, Usage
- Shop Management, Prioritizing, Sequencing
- Staffing-Space-Productivity-Balance-Vendor
- Facilities – Codes- Regulatory Compliance
- Inventory –Units - Usage – Availability - Remove
- Parts & Supplies – Just In Time - Backlog
- Specifications, Purchase, Terms, Conditions
- New Technologies–Trends-Benchmarks
- Emotional Intelligence-Ethics-End User
- Fuels – Ultra Low Sulphur, Alternative Fuels
- “Problem Identification”, “Resolving vs Solving”
- Bring Best Practices To A Higher Level &Your Exp

Proactive Asset Management Repair-Replace-Rebuild-Remove-Scrap-Sell-Trade

Equipment Management is a Five-Step Process:

- Selection
- Purchase
- Operation-Utilization-Excess
- Maintenance-Safe-Productive
- Cost Effective Replacement
- Disposition Accountabilities

- What –Configuration-Job
- How-Competition-Low Bid
- When-Tool-Work Methods
- Expectations, Environment
- Final Results, Life Cycle
- Responsible Liabilities

FLEET MANAGER

Proactive Verses Reactive Actions

Daily Down List, Units Out Of Service

Attendance, People, Space, Parts & Supplies

In House & Outside Resources

Repair Estimates

30% of The Units Residual Value , Purchase $

Choices, Repair, Rebuild, Replace, Remove, Rent

Causes, Accident, Abuse, PM, Bkdown, Warranty

Diagnosis, Parts New, Reman, Rebuild, Used

Space

Overtime

Recalls

Audit

FLEET MANAGER

Capital Budget Parameters
Operating Budget Parameters
Training, Vendor Advisory
PMI Frequencies Based On Units Condition
Active & Inactive Units
Audit Vendors
Outsourcing Benefits, Capability, Quality,
Technology, Tools, Experience, Frequency,
Experience, Reduced Comebacks
Activity Based Cost Reports
Management Information Systems

Vendor Analysis – Activity-Based Costing

Newark

	2014		2013		2012	
	# Done	$ Spent	# Done	$ Spent	# Done	$ Spent
Alternators	($15.94) – 358	$5,351	($10.48) – 596	$6,249	($9.41) – 615	$5,785
Batteries	($116.00) – 283	$32,827	($112.00) – 530	$59,632	($100.00) – 559	$56,102
Brakes	($23.00) – 141	$3,263	($29.00) – 273	$8,145	($18.00) - 296	$5,397
Starters	($41) - 72	$2,951	129	$5,121	180	$10,314
Shocks	1	$18	5	$248	-	-
Radiators	($35) - 18	$640	49	$5,695	48	$1,453
Tires	($148) - 439	$65,045	757	$118,524	658	$94,257
Totals	**($124.00) – 2,808**	**$350,146**	**($140.00) – 4,354**	**$613,118**	**($127.00) - 4,964**	**$634,235**

Jacksonville

	2014		2013		2012	
	# Done	$ Spent	# Done	$ Spent	# Done	$ Spent
Alternators	($23.00) – 186	$4,290	($60.00) – 245	$14,797	($58.00) – 89	$5,192
Batteries	($133.00) – 113	$15,034	($154.00) - 254	$39,168	($144.00) – 105	$15,127
Brakes	($53.00) – 15	$808	($59.00) – 87	$5,173	($66.00) – 38	$2,516
Starters	($183) - 20	$3,673	34	$6,177	29	$6,739
Shocks	-	-	-	-	-	-
Radiators	($33) - 4	$133	14	$465	12	$458
Tires	($168) - 126	$21,226	479	$90,753	223	$34,529
Totals	**($172.00) – 560**	**$96,403**	**($174.00) – 1,593**	**$277,932**	**($151.00) – 1,125**	**$170,876**

Vendor Analysis

Activity-Based Costing

Greensboro

	2014		2013		2012	
	# Done	**$ Spent**	**# Done**	**$ Spent**	**# Done**	**$ Spent**
Alternators	($144.00) – 30	$4,324	($118.00) – 131	$15,513	($64.00) – 272	$17,586
Batteries	($123.00) – 98	$12,087	($123.00) – 453	$56,088	($88.00) – 413	$36,693
Brakes	($136.00) – 61	$8,301	($171.00) - 321	$55,176	($1,193.00) – 270	$322,295
Starters	($103) - 62	$6,412	245	$32,209	251	$49,009
Shocks	($98) - 18	$1,777	178	$33,930	167	$34,696
Radiators	($366) - 37	$13,555	134	$53,913	122	$48,470
Tires	($287) - 320	$91,845	790	$185,499	418	$27,589
Totals	**($382.00) – 845**	**$323,413**	**($405.00) - 2,725**	**$1,106,252**	**($448.00) – 1,803**	**$807,851**

Activity-Based Costing

Fleet Trend Report

	Jan. '07	Apr. '07	Jul. '07	Oct. '07	Jan. '08
Total Units	421	365	345	331	329
Total Spent	$119,000	$109,000	$89,000	$79,000	$81,000
Total Budgeted	$90,000	$82,000	$87,000	$73,000	$80,000
% Variance	32%	33%	2%	8%	1%
¢ per Mile (Actual)	$0.82	$0.80	$0.66	$0.65	$0.63
¢ per Mile (Planned)	$0.64	$0.64	$0.64	$0.62	$0.62
Fully Burdened $	$83.12	$82.10	$71.04	$71.75	$69.60
Direct Labor $	$53.67	$53.04	$41.04	$41.75	$39.60
# Power Units	320	277	262	252	252
Average Age	8.2	6.7	5.8	4.3	4.3
Usage (000)	185	180	184	189	196
% Operated	75%	84%	92%	97%	98%
Usage per	579	650	703	752	763
Downtime	15%	17%	8%	4%	3%
% Backlog	20%	10%	4%	4%	4%
Road Call Miles	2,500	2,800	3,700	4,300	4,600
# People	35	33	25	25	22
% PM	0.1	0.3	0.3	0.35	0.35
% Scheduled	0.35	0.35	0.35	0.4	0.4
% Inventory	10%	10%	8%	-20%	-5%
% Received v. Issued	20%	25%	25%	-10%	-5%
% Ordered vs. Received	20%	25%	25%	-10%	-10%

Repair/Replace/Rebuild
ROI
Return On Investment

Before you spend more than 30% of the vehicle's residual value on any repair – perform a total vehicle repair analysis

Cost of **old** vs. cost of **new**

Bus Operating & Maintenance Cost

PPOACTIVE LIFE CYCLE TARGET

Accumulated maintenance cost
Equals the original purchase price

And/or

The annual maintenance cost is 30%
of the present residual value

Evaluation & Decision Time
For Planning & Funding

Before the old costs more than the new

to own and/or operate it, When is time to decide?

When the Maintenance Cost is 30% of Residual $

Replace the old?

Rebuild the old?

Repair the old?

Rent – Lease ?

Remove the unused old ?

Cost, Reliability & Configuration are the issues

Cumulative Maintenance Equals Original Cost

Cost Effective Lifecycle

of

Transportation Equipment

PURCHASING "RULES"

Solicitation of Transportation

Parts & Supplies

Decision Makers

- Must understand vehicle repair, rebuild & replacement process's for proactive funding
- When the cost of old exceeds cost of new
- Cumulative maintenance=Orig. purchase $
- Rebuild, ½ cost of new, ¾ life of new
- Economy, Sizing, Strategic, Tactical Plans
- Maintenance costs, Parts & Labor costs increase each year as the Bus ages
- Capital(depreciation)Operate(Consumables)
- Consistent, Level zed funding needed
- What operations needs versus wants

Decision Makers, Life Cycle

- Measure, Watch, Pay Attention
- Public vs Private Organizations
- Must understand vehicle repair, replace, rebuild, remove
- Sell vs Scrap, Liability Risk
- Proactive, Two Years To Get Funding & Supply Unit
- Impacts on maintenance & repair costs, old vs new
- Impacts on capital costs, depreciation, old vs new
- Impacts on operating costs, consumables, old vs new
- Consistent funding needed, avoid peaks & valleys
- Customer, End User, Want vs. Need
- Circumstances – Choices – Distractions – Control
- Cumulative Maintenance Equals Original Price
- Cost of Old vs Cost of New, Reliability, Operating $

$18,500 Light Vehicle

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Principle	4,440	4,440	4,440	4,440	740	-	-	-
Interest	952	703	486	259	37	-	-	-
Cumulative Maintenance Cost	(360)	(1,095)	(2,190)	(3,405)	(4,752)	(6,345)	(8,010)	(14,210)
Parts/ Labor	360	735	1,095	1,215	1,380	1,560	1,665	6,200
Fuel	480	480	480	480	500	500	500	500
¢/mile 15,000	0.414	0.423	0.433	0.426	0.197	0.137	0.144	0.446
Resale	12,950	10,360	8,288	6,630	5,304	4,243	3,395	2,716
% Maintenance Residual	3%	7%	13%	18%	26%	37%	49%	228%

Cumulative Maintenance Cost 1/3 of New Cost.
Annual Maintenance Cost 30% of Residual Cost.

Replace Target Evaluation { **Repair Replace Rebuild**

Depreciation Schedule

Year 1	0.70	-$100,000	=$70,000
Year 2	0.56		=$56,000
Year 3	0.45		=$45,000
Year 4	0.36		=$36,000
Year 5	0.29		=$29,000
Year 6	0.23		=$23,000
Year 7	0.18		=$18,000
Year 8	0.15		=$15,000
Year 9	0.12		=$12,000
Year 10	0.09		= $9,000
Year 11	0.08		= $8,000
Year 12	0.06		= $6,000
Year 13	0.05		= $5,000
Year 14	0.04		= $4,000
Year 15	0.03		= $3,000
Year 16	0.02		= $2,000
Year 17	0.019		= $1,900
Year 18	0.015		= $1,500
Year 19	0.012		= $1,200
Year 20	0.009		= $900

$70,000 Chassis-Mtd. Equipment

	1	2	3	4	5	6	7	8	9	10
Princip	14000	14000	14000	14000	14000	-	-	-	-	-
Interest	3500	2800	2100	1400	700	-	-	-	-	-
Parts/ Labor	1455 7.3	2475 12.4	3780 18.9	3690 18.4	3495 17.5	3375 16.9	3800 19	4500 22.5	8500 42.5	22425 112.1
Fuel	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
¢/mile 15,000	1.50	1.53	1.57	1.51	1.45	0.47	0.49	0.54	0.81	1.74
Resale	49000	39200	31360	25088	20014	14056	1284 5	10276	8221	6577
% Mainten Residua	3%	6%	12%	15%	17%	21%	30%	44%	103%	341%

Replace Target Evaluation (repair / replace / rebuild)

Vehicle Replacement Strategies

$100,000 Bus/Truck

Year	1	2	3	4	5	6	7	8	9	10
Principle	$20,000	$20,000	$20,000	$20,000	$20,000					
5% Interest	$5,000	$4,000	$3,000	$2,000	$1,000					
Parts & Labor	$4,500 22.5 hrs	$7,500 37.5 hrs	$9,500 47.5 hrs	$9,500 47.5 hrs	$9,500 47.5 hrs	$10,500 52.5 hrs	$10,500 52.5 hrs	$11,500 57.5 hrs	$12,000 60 hrs	$27,000 135 hrs
Fuel/Year	$20,000	$21,200	$22,472	$23,820	$25,250	$26,765	$28,370	$30,073	$31,877	$33,790
Operating Cost: $/Mile*	$2.75	$2.93	$3.17	$3.18	$3.21	$0.64	$0.64	$0.75	$2.71	$3.37
Resale Value	$70,000	$56,000	$44,800	$35,840	$28,672	$22,938	$18,350	$14,680	$11,744	$9,395
Maintenance = X% of Residual Value	6.%	13.%	21.%	26.%	33%	46%	57%	78%	102%	287%

*Operating cost: $/mile based on 18,000 mile/year

Cumulative life maintenance cost vs. purchase price

Vehicle Replacement Strategies – Based on $150,000 Unit

	1	2	3	4	5	6	7	8	9	10
	30,000	30,000	30,000	30,000	30,000	-	-	-	-	-
	7,500	6,000	4,500	3,000	1,500	-	-	-	-	-
or	4,500 22.5	7,500 37.5	11,500 57.5	11,500 57.5	11,500 57.5	11,500 57.5	11,500 57.5	13,500 67.5	27,500 137.5	67,000 335
	20,000	21,200	22,472	23,820	25,250	26,765	28,370	30,073	31877	33790
*	2.33	2.42	2.56	2.47	2.39	0.64	0.64	0.75	1.50	3.72
	105,000	84,000	67,200	53,760	43,008	34,406	27,525	22,020	17,616	14,093
e	4%	9%	17%	21%	27%	33%	42%	61%	153%	475%

*Operating Cost: $/mile based on 18,000 mi/yr

$450,000 Loader/Bus/Crane

	1-4	5	6	7	8	9	10	11	12	13
Parts/ Labor	30000	45000	48000	50000	55000	60000	65000	65000	65000	65000
Hours	150	225	240	250	275	300	325	325	325	325
$/mile 30000	1.00	1.50	1.60	1.66	1.83	2.00	2.16	2.16	2.16	2.16
Resale	252000	130000	103000	83000	66000	53000	43000	34000	27000	21000
% Maint. Residual	12%	35% ?????	46%	60%	83%	113%	154%	192%	240%	300%

Replace Target Evaluation
(repair / replace / rebuild)

VEHICLE ASSESSMENT REPORT

VEHICLE # ______________ MAKE: ______________ MODEL & YEAR: ______________

RATING LEGEND: 5= EXCELLENT : 4= VERY GOOD : 3= GOOD : 2= AVERAGE : 1= POOR

DESCRIPTION	AWARDED RATE	MULTIPLIER	ACTUAL RATE	MAX RATE	FACTOR	SCORE
SECTION -01 CHASSIS			TOTAL MAX POINTS = 15			10.8
RUST & CORROSION	3	20	60	100		
CONDITION	3	20	60	100		
ACCIDENT DAMAGE	4	40	160	200		
GLASS	5	10	50	50		
INTERIOR	3	10	30	50	360	72%
			360	500	500	
SECTION -02 TIRES			TOTAL MAX POINTS = 15			9.0
TREAD WEAR	3	60	180	300		
SIDEWALL CONDITION	3	40	120	200	300	60%
			300	500	500	
SECTION -03 BODY MOUNTED EQUIP			TOTAL MAX POINTS = 15			9.0
DUMP BODY EXTERIOR	3	20	60	100		
DUMP BODY INTERIOR	3	20	60	100		
TAIL GATE	3	20	60	100		
EXTENSION BOARDS	3	20	60	100		
LIFT CYLINDER	3	20	60	100	300	60%
			300	500	500	
SECTION -04 BRAKE SYSTEM			TOTAL MAX POINTS = 15			12.0
SERVICE BRAKES	4	60	240	300		
EMERGENCY BRAKES	4	40	160	200	400	80%
			400	500	500	
SECTION -05 STEERING/SUSPENSION			TOTAL MAX POINTS = 15			12.0
LOOSENESS	4	20	80	100		
VIBRATION	4	20	80	100		
PULLING	4	20	80	100		
PARALLEL TO GROUND	4	40	160	200	400	80%
			400	500	500	
SECTION -06 ENGINE & DRIVELINE			TOTAL MAX POINTS =25			16.0
LEAKS	2	20	40	100		
VIBRATION	2	20	40	100		
NOISE	3	20	60	100		
SHIFTING	4	20	80	100		
ROUGH RUNNING	5	20	100	100	320	64%
			320	500	500	
GRAND TOTAL	Total Rate Awarded		2080	Total Score		68.8

Awarded Rate Legend
2400-3000-Excellent
1800-2400-Very Good
1200-1800-Good
600-1200-Average
0-600-Poor

Awarded Score Legend
80-100- Excellent
60-80-Very Good
40-60-Good
20-40-Average
0-20-Poor

Average Age Measures Efficient Life Cycles

#	YEAR	AGE	TOTAL
2	2015	1	2
3	2014	2	6
5	2013	3	15
7	2012	4	28
3	2011	5	15
20			**66**

Average age – 3.3 years

Vehicle Assessment Report

Truck Mixer Vehicle Assessment Report

Vehicle #	4521			
Chassis Make	Mack	**Mixer**	McNeilus	(rear)
Model	DM			
Year	1995			
Mileage	232,000	**Hours**	24,700	

nt 4 = Very Good 3 = Good 2 = Average 1 = Poor

Description	Awarded Rate	Multiplier	Awarded Rate	Max Rate	Score	Statistical Weight	
Section 1: Chassis						15	%
Rust & Corrosion	3	20	60	100			
Frame/Axle Condition	3	20	60	100			
Accident Damage	4	40	160	200			
Glass	5	10	50	50			
Interior	3	10	30	50			
Subtotal			**360**	**500**	72%		
Section 2: Tires						10	%
Tread Wear	3	60	180	300			
Sidewall Condition	4	40	160	200			
Subtotal			**340**	**500**	68%		
Section 3: Mixer Body						20	%
Mixer Body Exterior	2	20	40	100			
Mixer Drum Condition	1	30	30	150			
Liftable Axle(s)	3	20	60	100			
Drum Drive & Hydraulics	4	30	120	150			
Subtotal			**250**	**500**	50%		
Section 5: Brake System						10	%
Service Brakes	4	60	240	300			
Emergency Brakes	4	40	160	200			
Subtotal			**400**	**500**	80%		
Section 5: Steering/Suspension						15	%
Looseness	4	20	80	100			
Vibration	3	20	60	100			
Pulling	4	20	80	100			
Parallel to Ground	4	40	160	200			
Subtotal			**380**	**500**	76%		
Section 6: Engine & Driveline						20	%
Leaks	2	20	40	100			
Vibration	2	20	40	100			
Noise	3	20	60	100			
Shifting	4	20	80	100			
Rough Running	3	20	60	100			
Subtotal			**280**	**500**	56%		
Section 7: Year & Mileage/Hours						10	%
Year	1	30	30	150			
Mileage or Hours	1	70	70	350			
Subtotal			**100**	**500**	20%		
TOTAL			**2110**	**3500**	60%	**100**	%

Shop Management

- Scheduled Maintenance (Maintenance)
- Unscheduled Maintenance (Repair)
- Preventive Maintenance, Diagnostics
- Training – Productivity – Regulatory Rules
- Work Scheduling, Conditional Maintenance
- Productivity – Prioritize, Sequence
- Backlog, Two Weeks of Resources
- Staffing Direct & Indirect Labor
- Space Management, People, Parts, Equipt
- Availability, Utilization, Sustained Reliability
- Warranty, Latent Defects, Recalls, Campaigns

VEHICLE REPAIR WORKSHEET

LABOR __________ PAY HOURS __________ DATE _____________

	Vehicle Number	Date Out of Service	Reason for Repair	Parts Cost	Labor Hrs.	Where Repaired	Estimated Back in Service Date
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

TRAINING-DOCUMENTED

- Fork Lift-3 years, A/C Service, Alcohol, DrugsTires-29CFR1910.177 Refrigerant Purchase Right To Know, Global Harmonized System (GHS)Lock Out Tag Out 29CFR 1910.147.
- Fire Drill 2x's per year 29CFR1910.155
- Haz Mat Storage-MSDS-Handling-29CFR1910,101-26Brake Certification CFR 396.25, Confined Spaces Personal Protective Equip-Annually 29CFR1910.132CDL, Annual MVR, Violations-Med Card-Self Declare
- Blood Borne Pathogens 29CFR 1910.1030

POLICY & PROCEDURE

- A MAXIMUM OF ONE PAGE/POLICY+ATTACHMENT
- Have an index Alphabetically & Chronologically
- PURPOSE – What is the issue you want to outline
- POLICY – The title that addresses the issue
- PROCEDURE – Describe in detail addressing the issue

Public Works and

Engineering

Policy/Procedure

Issuing Division: Central Motor Pool **Number: #13**

To: Central Motor Pool Staff

Subject: DVIR –Driver Vehicle Inspection Report

Effective Date: 2/8/08

Issued By: JEDolce
John E. Dolce, Director-Central Motor Pool

Approved By:______________________
Director

1. PURPOSE: Establish Pre & Post Trip Vehicle and Equipment Inspection(s) that meet Federal Code#396.11 and New Jersey Inspections regulations, NJAC 13:20-26.11

2. POLICY: All Employees that will operate vehicles and Equipment that are 10,001 lbs. GVWR and higher, must turn in a (DVIR) Driver Vehicle Inspection Report each time they operate a unit.

3.PROCEDURE: Pick up a (DVIR) Driver Vehicle Inspection Report (Attachment #1) from your Dispatcher or Supervisor prior to operating your vehicle and or equipment. Inspect the unit before you operate it. Fill out the DVIR form and sign it if the unit is safe to operate. When you are finished turn in the signed original to your Dispatcher or Supervisor for a ninety day filing and keep the second copy in the truck for the next driver.

If there are defects, turn in the signed original and first copy to your Dispatcher or Supervisor who will initiate corrective action. Keep the last copy in the vehicle. The person who takes the action (Mechanic) will sign the original and both copies and will keep the first copy and return the original and the second copy of the DVIR to the Truck for the next driver to sign that the defect was corrected. The mechanic will give the first signed copy to their supervisor who will file the DVIR copy in the vehicle history file jacket. The driver will keep the second copy in the Truck for at least one day. The original will go to Dispatch for a 90 day filing.

VEHICLE & EQUIPMENT TRIP REPORT

PRE-TRIP_______ POST-TRIP_______

DEPT_____________________ DATE of REPORT_____________________

VEHICLE #_____________________ TRAILER #_____________________

MILEAGE_____________________

ITEM INSPECTED

Service Brakes____	Seat Belts________	Mud Flaps________
Parking Brakes____	Fuel System________	Steering________
Lights/Reflectors____	Tires________	Driveline________
Horn(s)________	Wipers________	Springs&Suspension____
Coupling Devices____	Wheels/Rims________	Axles-Tie Rods________
Emergency Equip____	Cooling System________	Body Damage________
Transmission________	Clutch________	Glass-Windshield________
Frame________	Exhaust/Emission____	Mirrors________
	Safe Loading________	

REMARKS____

____

____

Driver Signature _____________________________ Date__________

Vehicle is ☐ satisfactory ☐ unsatisfactory

Mechanic__________________ Above defect(s) corrected__________

Date__________ Above defect(s) do not affect vehicle safety________

Operator/Driver Signature _____________________ Date __________

Defect(s) corrected ____

white - Department *yellow* - Motor Pool *pink* - Vehicle

ps________
e________
&Suspension____
ie Rods________
amage________
indshield________
Driver Signature _____________________________ Date__________
Vehicle is ☐ satisfactory ☐ unsatisfactory
Mechanic__________________ Above defect(s) corrected__________
Date__________ Above defect(s) do not affect vehicle safety________
Operator/Driver Signature _____________________ Date __________
Defect(s) corrected ____
white - Department *yellow* - Motor Pool *pink* - Vehicle
aps________
e________
&Suspension____
ie Rods________
amage________
indshield________
Date__________
Mechanic__________________ Above defect(s) corrected__________
Date__________ Above defect(s) do not affect vehicle safety________
Operator/Driver Signature _____________________ Date __________
Defect(s) corrected ____
white - Department *yellow* - Motor Pool *pink* - Vehicle

7

Maintenance”

Scheduled maintenance is planned maintenance activity to maximize productivity of vehicles, manpower and facilities.

- Preventive maintenance inspections
- Preventive maintenance generated repairs
- Driver daily write-ups
- Planned component changes - Tires
- Predictive maintenance – Water Pump
- Conditional Maintenance

30%→70%

Preventive Maintenance

- Preventive Maintenance Inspections are the prioritized, sequenced, timely inspections of vehicles and equipment for potential problems that can be avoided by lubricating, adjusting, tightening, re-routing, clamping, testing or adding fluid.
- Scheduling is planned based on conditional maintenance, unit age, use, environment, time, mileage, hours and/or fuel use.
- It is adjusted through breakdown analysis including road calls, premature component failures and repeat repairs. Fleets change density, mix and age annually, impacting effective preventive maintenance programs.

Preventative Maintenance Parameters

- Mileage, time, fuel use, hours, repetitions, idle times
- Gas or diesel
- Inner City, City, Suburban, Rural
- Environment, Dirty, Sand, Clay, Rock
- Dispatch Points
- Age of Unit
- Conditional Maintenance
- Manufacturers Recommendations

Preventative Maintenance Parameters

- Environment
- Idle times
- Unscheduled:
  - Breakdowns
  - Repeat repairs
  - Road calls
  - Defects from pre/post trips
- Premature failures: Warranty
- Age: Young – Old – Calculated Just right
- Annual actions: Quarterly reviews
- Backlog
- Manufacturers Recommendations

Qualification
Central Motor Pool
Brake Inspection

I ______________________ have had _______ years experience performing brake inspections, maintenance service and/or repairs to commercial vehicles that meet Federal Regulation 396.25(D) and New Jersey applicable Regulations.

Employee Signature ____________________

Shop Supervisor ____________________

General Supervisor ____________________

Division Head
Automotive Services ____________________

Director of
Automotive Services ____________________

Attachment #1

ANNUAL VEHICLE INSPECTION REPORT

VEHICLE HISTORY RECORD	
REPORT NUMBER	FLEET UNIT NUMBER
DATE	

MOTOR CARRIER OPERATOR	INSPECTOR'S NAME (PRINT OR TYPE)
ADDRESS	THIS INSPECTOR MEETS THE QUALIFICATION REQUIREMENTS IN SECTION 396.19. ☐ YES
CITY, STATE, ZIP CODE	VEHICLE IDENTIFICATION (✓) AND COMPLETE ☐ LIC. PLATE NO. ☐ VIN ☐ OTHER
VEHICLE TYPE ☐ TRACTOR ☐ TRAILER ☐ TRUCK ☐ (OTHER)	INSPECTION AGENCY/LOCATION (OPTIONAL)

VEHICLE COMPONENTS INSPECTED

OK | NEEDS REPAIR | REPAIRED DATE | ITEM

1. BRAKE SYSTEM
   - a. Service Brakes
   - b. Parking Brake System
   - c. Brake Drums or Rotors
   - d. Brake Hose
   - e. Brake Tubing
   - f. Low Pressure Warning Device
   - g. Tractor Protection Valve
   - h. Air Compressor
   - i. Electric Brakes
   - j. Hydraulic Brakes
   - k. Vacuum Systems
2. COUPLING DEVICES
   - a. Fifth Wheels
   - b. Pintle Hooks
   - c. Drawbar/Towbar Eye
   - d. Drawbar/Towbar Tongue
   - e. Safety Devices
   - f. Saddle-Mounts
3. EXHAUST SYSTEM
   - a. Any exhaust system determined to be leaking at a point forward of or directly below the driver/sleeper compartment.
   - b. A bus exhaust system leaking or discharging to the atmosphere in violation of standards (1), (2) or (3).
   - c. No part of the exhaust system of any motor vehicle shall be so located as would be likely to result in burning, charring, or damaging the electrical wiring, the fuel supply, or any combustible part of the motor vehicle.
4. FUEL SYSTEM
   - a. Visible leak
   - b. Fuel tank filler cap missing
   - c. Fuel tank securely attached
5. LIGHTING DEVICES
   All lighting devices and reflectors required by Section 393 shall be operable.
6. SAFE LOADING
   - a. Part(s) of vehicle or condition of loading such that the spare tire or any part of the load or dunnage can fall onto the roadway.
   - b. Protection against shifting cargo
7. STEERING MECHANISM
   - a. Steering Wheel Free Play
   - b. Steering Column
   - c. Front Axle Beam and All Steering Components Other Than Steering Column
   - d. Steering Gear Box
   - e. Pitman Arm
   - f. Power Steering
   - g. Ball and Socket Joints
   - h. Tie Rods and Drag Links
   - i. Nuts
   - j. Steering System
8. SUSPENSION
   - a. Any U-bolt(s), spring hanger(s), or other axle positioning part(s) cracked, broken, loose or missing resulting in shifting of an axle from its normal position.
   - b. Spring Assembly
   - c. Torque, Radius or Tracking Components.
9. FRAME
   - a. Frame Members
   - b. Tire and Wheel Clearance
   - c. Adjustable Axle Assemblies (Sliding Subframes)
10. TIRES
    - a. Tires on any steering axle of a power unit.
    - b. All other tires.
11. WHEELS AND RIMS
    - a. Lock or Side Ring
    - b. Wheels and Rims
    - c. Fasteners
    - d. Welds
12. WINDSHIELD GLAZING
    Requirements and exceptions as stated pertaining to any crack, discoloration or vision reducing matter (reference 393.60 for exceptions)
13. WINDSHIELD WIPERS
    Any power unit that has an inoperative wiper, or missing or damaged parts that render it ineffective.

List any other condition which may prevent safe operation of this vehicle.

INSTRUCTIONS: MARK COLUMN ENTRIES TO VERIFY INSPECTION: _X_ OK, _X_ NEEDS REPAIR, _NA_ IF ITEMS DO NOT APPLY, ____ REPAIRED DATE

CERTIFICATION: THIS VEHICLE HAS PASSED ALL THE INSPECTION ITEMS FOR THE ANNUAL VEHICLE INSPECTION REPORT IN ACCORDANCE WITH 49 CFR 396.

200-FS-C2
Rev. 3/94

ORIGINAL

Motor Pool

PERIODIC (ANNUAL) INSPECTION FORM 49CFR SEC.396.17
AND NJ ADMINISTRATIVE CODE 13:20-26.11

Vehicles 4500 miles or 12 months / Buses 4500 miles or 6 months / Equipment at 250 hours or 6 months

DEPARTMENT____________________ VEHICLE #____________

VEHICLE BARCODE____________________ VEHICLE PLATE #____________

UNIT CONDITION - Excellent ____ Good ____ Poor ____ Unsafe ____

VEHICLE COMPONENTS INSPECTED

OK	Needs Repair	Repair Date		OK	Needs Repair	Repair Date	
			Vehicle History				Service Brakes ✓
			NJ State Insp.				Parking Brakes ✓
			Coupling Devices ✓				Diesel Emissions
			Exhaust-Emissions ✓				Cooling Sy SCA
			Fuel System ✓				Clutch-Transmission
			Light Reflectors ✓				Tie Rods-Axles
			Load Security ✓				Drive Lines & Rear
			Steering System ✓				Mounted Eq. Insp.
			Suspension -Springs ✓				Body Damage
			Frame ✓				Interior Gauges
			Tire & Flaps ✓				Washer Fluid
			Wheels & Rims ✓				Hinges-Latch-Lock
			Windshield-Glass ✓				Glad hands
			Windshield Wipers ✓				Fluids & Filters
			Safety Equipment				Pulley & belts
			Fire Extinguisher				Lubricate
			Horn(s)-Mirror(s)				Other__________
			Battery				Other__________

Comments ____

____

____

This vehicle has passed all the Annual inspection items of 49CFR396.17 ____________

Inspector initial ________ Date ____________

Supervisor signature ____________________ Date ____________

Section 5 6 A

Original - Vehicle History File *Copy* - Put in the Vehicle Inspected

Activity Based Costing

General Ledger

Accounts Payable

WORK ORDER DATE	COMPANY CODE	FACILITY CODE	VEHICLE IDENTIFICATION	ENGINE	VEHICLE NO.	P.O. NO.	WORK ORDER NO. 13507

WHEEL BASE

OUT OF SERVICE DATE TIME AM PM	YEAR	MAKE & MODEL	CONTACT FOR PICKUP NAME ______ # ______	MILEAGE
RETURNED TO SERVICE DATE TIME AM PM	LICENSE NO.	DEPARTMENT ______ DIVISION ______		

CHECK ONE BOX ONLY	
SCHEDULED	A
NON–SCHEDULED	B
ROAD CALL	C
CHECK ONE BOX ONLY	
NORMAL WEAR	R
WARRANTY	S
DAMAGE	T
ACCIDENT	V
TRANS.	

PARTS

Parts and Materials Required	QTY	NUMBER/DESCRIPTION/UNIT COST	TOTAL COST	INVOICE NO.

PROBLEM	CORRECTIVE PROCEDURE

CK EACH APPROPRIATE BOX		
Air Conditioning	03	
Brakes, Reline/Replace	04	
Brekes, Repair/Adj.	05	
Steering	09	
Suspension	10	
Wheel/Rim/Hub/Bearing	11	
Axles, Driven	14	
Clutch, Replace/Rebuild	15	
Clutch, Repair/Adj.	16	
Drive Shafts	18	
Power Take Off	20	
Transmission, Replace	21	
Transmission, Repair	22	
Air Intake System	25	
Cooling System	26	
Exhaust System	27	
Fuel System	28	
Power Plant, Replace	29	
Power Plant, Repair	30	
Charging System	32	
Cranking System	33	
Battery	34	
Ignition System	35	
Lighting System	36	
Accessories	46	
Power Tail Gate	49	
Tires	55	
Towing	56	
Cylinders/Pistons	67	
Line/Hoses/Fittings	68	
Cab/Body	70	
Compressor	72	
Prev., Maint.	75	
Cables	77	
Brooms/Brushes	80	
Other	83	

LABOR

HRS.	MIN.	REPAIR TYPE	EMPLOYEE

OUTSIDE COST

LABOR $	PARTS $	TOTAL $	REPAIR TYPE

Activity

Based

Costing

600 CS maintenance analysis by class – Sheet 1

Class 32 All All – 12 periods

Repair num.	Type desc.	Num veh.	Num R/O	Maintenance Total dol.	Maintenance Comm dol.	Parts dol.	Labor dol.
PMA		52	755	23,418		8,713	14,705
PMB		51	584	12,458		300	12,158
PMC		46	181	16,471		381	16,090
PMD		1	1	25			25
PME							
PMF							
PMG							
Sub	Total			52,373		9,385	42,978
111	Axle non D	25	33	5,550	125	2,756	2,669
113	Brakes replace	41	152	57,943	33	37,324	20,585
213	Brakes repair	50	583	40,903		15,907	24,997
114	Frame	31	81	6,764		1,430	5,335
115	Steering	44	319	32,273	106	14,326	17,842
116	Suspension	44	302	46,885	265	22,978	23,621
118	Wh. rim, H&B	42	231	16,275	42	5,459	10,774
121	Axle dr F						
122	Axle dr R	35	107	12,555		6,039	6,516
123	Clutch replace	26	65	21,967		13,554	8,413
223	Clutch repair	31	159	3,366		572	2,795
124	Dr shafts	35	88	4,762		1,825	2,937
125	P T C	43	191	8,470		3,431	5,039
126	Trans replace	21	20	6,578		3,228	3,350
226	Trans repair	41	147	18,914		7,444	11,470
128	Trans aux	1	1	12			12
141	Air intake	33	101	3,072		1,190	1,882
142	Cooling	48	281	11,765	38	5,540	6,187
143	Exhaust	42	249	9,698		3,681	6,018
144	Fuel sys	53	643	21,353		7,229	14,124
145	Power replace	28	43	39,679		26,986	12,893
245	Power repair	49	336	30,114	42	10,065	20,007
131	Charge sys	46	288	11,950		6,503	5,447
132	Crank and battery	40	154	6,692		2,980	3,712
133	Ignition	39	528	24,242		8,799	15,443
134	Lighting	53	1,616	40,129		11,671	28,458
103	Ins and gage	46	149	4,969		1,258	3,711
102	Cab doors	46	149	9,518	189	3,982	5,347
Sub total		49	321	496,376	840	226,156	289,380
701	Hyd pump	36	77	18,912		15,470	3,442
702	Hyd motor	25	28	1,258		270	988
703	Hyd valve	48	193	14,524		4,691	9,833
704	Hyd cylin	34	75	6,359		3,159	3,200
705	Hyd fittin	48	304	18,059		4,297	13,761
706	Bucket ect	39	118	6,346		988	5,359
707	Boom	50	348	24,011	427	3,546	20,039
708	Boom excess	29	51	4,076		622	3,454
709	Turret ect	35	89	6,343		510	5,833
710	Outrigger	3	1	83			83
711	Winch	4	3	28			26
117	Tires	50	659	110,803	3,021	94,876	12,906
Sub total				210,799	3,448	128,427	78,924
All other repair types						48%	52%
Total				**759,548**	**4,289**	**363,978**	**391,282**

Maintenance-Component Life Cycle Costs of Vehicle Class

Type - Description	Num veh.	Num R/O	Total DOL	Comm DOL	Parts DOL	Labor DOL
Tires	50	659	110,803	3,021	94,875	12,906
Brakes replace	41	162	57,943	33	31,324	20,585
Brakes repair	50	563	40,903	–	15,907	24,997
Power replace	28	43	39,679	–	26,968	12,693
Power repair(40% Cooling)	49	336	30,114	42	10,065	20,007
Preventive maintenance	150	1501	68,124	–	3,410	64,714
Suspension	44	302	46,865	265	22,978	23,621
Lighting (LED)	53	1,616	40,129	–	11,671	28,458
Steering	44	319	32,273	106	14,326	17,842
Total for top 7 components			**457,347**		**231,524** **50.62%**	**225,823** **49.48%**
Total for all			**759,548**		**363,978** **47.92%**	**391,282** **52.08%**

"Repair"…."Running Repairs"

Unscheduled maintenance is unplanned or surprise maintenance activity, raising vehicles life cycle costs and lowering productivity of vehicles, manpower and facilities.

- Road calls
- Breakdowns
- Premature components
- Repeat repairs
- Conditional Maint

70%→30%

Activity-Based Costing
Analysis Road Calls – April-August

System average		Category	Contractor A		Contractor B		Contractor C	
#	%		#	%	#	%	#	%
97	18	Hydraulic	13	12	16	14	68	28
151	32	Electrical	51	45	36	30	64	26
82	17	Mechanical	14	12	23	21	45	19
17	5	Abuse	1	1	14	12	2	1
37	9	Cooling	13	12	12	10	12	5
37	7	Tires	6	5	8	6	23	10
15	4	Fuel	7	6	5	4	3	2
8	3	Exhaust	4	4	–	–	4	2
26	5	Brakes	3	3	3	3	20	9
470	100	Total	112	100	117	100	241	100

Electrical – 151

Battery ……………………….	121
Starter ……………………….	15
Alternator …………………….	25
Cables ………………………..	20
Stoplights …………………….	25
Marker lights ……………….	25

Total …………………………..	151

Hydraulic – 97

Lines & fittings ………………	45
Fluids …………………………….	15
Motor ………………………………	15
Add oil ……………………………	25
Bleed system …………………	15
Controls ………………………..	10
Fiber optics …………………..	25
Total	97

Mechanical – 82

Overheat control …………………	15
Low oil control ……………………	15
Fuel pump ………………………..	20
Engine noise ……………………	25
Engine leak ……………………..	25
Alternator ………………………..	15
Belts ……………………………….	25
Total	82

Bus, Service Delay Incident Report
6 month Interval

Cooling system	16%	
No Start	13%	
Electric	12%	
Engine Shutdown	11%	
CNG	8%	Design related
Brakes	8%	
Tires, Steer, Susp	8%	Street caused
Trans	7%	
Body Mirror	7%	Street Caused
Accident	5%	Street Driver
Heat, A/C	2%	
Dirty Bus	1%	Street Passenger
Fare Box	1%	Street Dirt
Exhaust Fumes	1%	
Fuel	1%	
		30% Street, 70% Maintenance

Common Class – High Cost Components

ALL

- Tires
- P.M.
- Power plant (Cooling)
- Brakes
- Cab – sheet metal, plastic
- Steering
- Suspension

Top 7 costs better than 70% of all costs

MOST

- Lights (LED)
- Cooling-A/C-Heat
- Exhaust ,DPF,DEF
- Fuel
- Cranking, Battery, Starter
- Clutch
- Abuse, Accident

Warranty

- Poor Materials, Workmanship, Latent Defect
- Manufacturer – Fleet Relationship Improve.
- Fleet must drive manufacturer for reimbursement.
- Warranty Terms & Conditions are fair but settlement in complex/complicated.
- Simplify Process, Liability, Discovery, In House
- Early Communications on product problems before becoming repair/recall campaigns.
- Retail Warranty Labor, Conditional Maintenance
- Unsafe

Implied Warranty

WARRANTY

Strict Liability

Product defect

Negligence Conduct

Breech of express warranty

Breech of implied warranty for sale

Implied warranty for fitness

Right to Repair

“Policy Adjustment”

Exhaust System Technology Is Not An Alternative Fuel System

EGR vs SCR

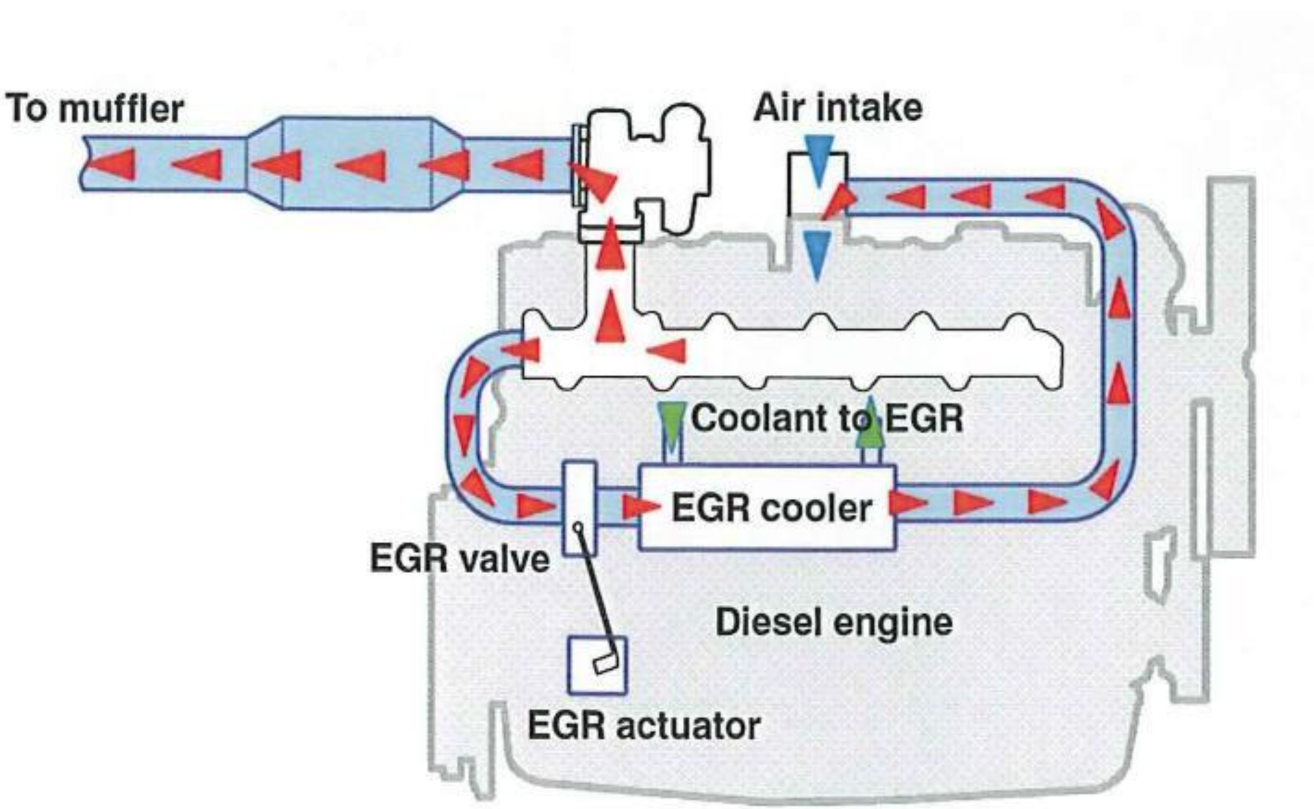
- Exhaust Gas Recirculation
- Supplemental Catalytic Reduction, Urea (ammonia + di-ionized H2O)
- Re Generation

Antifreeze

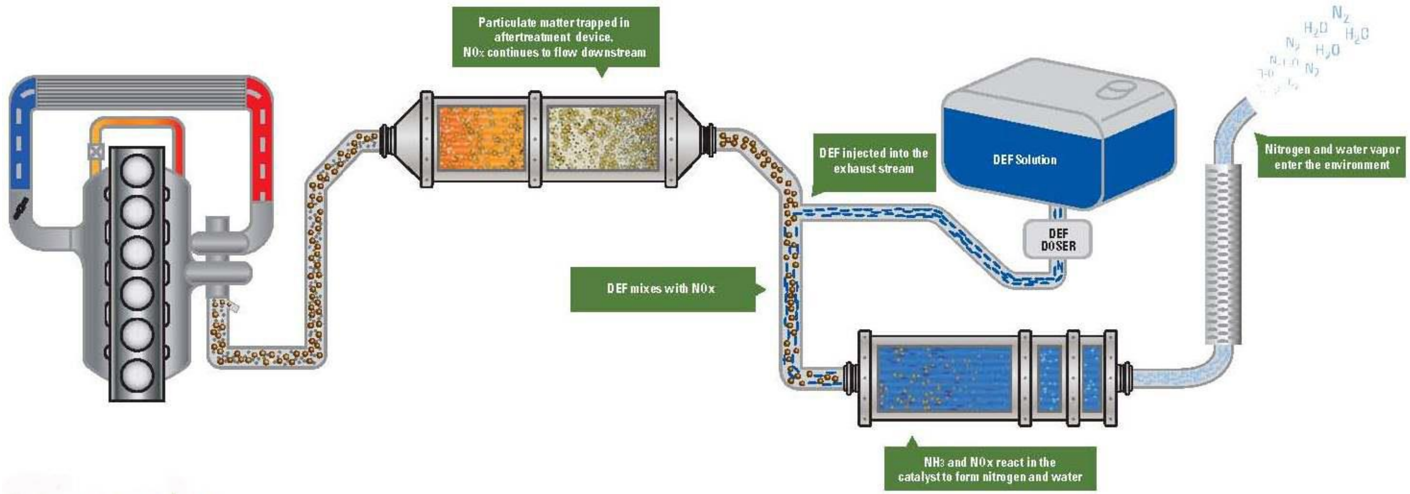
- Extended Life
- Gasoline
- Diesel
- Waterless

- Clean DPF $600-$1500
- On – Off Vehicle
- Outsource, In House

EGR SYSTEM: How it Works



SCR SYSTEM: How it Works



SCR vs. EGR

- Two basic ways to reduce oxides of nitrogen (NO_x) in diesel exhaust
  - Get rid of the NO_x after it's produced
  - Try not to produce much NO_x in the first place
- NO_x formation is a function of the high combustion temperature in diesel engines
  - The hotter the combustion temperature, the more NO_x is created

SCR vs. EGR

- If you want to reduce NO_x formed during combustion, you need to lower the peak combustion temperature by reducing the number of oxygen molecules available
  - This is the basic ERG approach
  - It deprives the combustion event of oxygen by introducing cooled exhaust gas, which is lower in oxygen, into the intake system, thereby reducing the combustion temperature and lowering NO_x production

SCR vs EGR

- If you want to reduce NOx “AFTER” it’s formed you need to break it apart into Nitrogen & Water Vapor.
- The basic SCR approach is Urea (DEF, Diesel Emission Fluid) injected into the exhaust stream. 33% Ammonia, 67% Di-Ionized Water
- In the presence of a catalyst, the Urea turns into Ammonia & Carbon Dioxide which reacts with the NOx to form Nitrogen & Water Vapor
- Driver, Operator Training, Regeneration, Loss of Power

Hydrocarbons & NOx

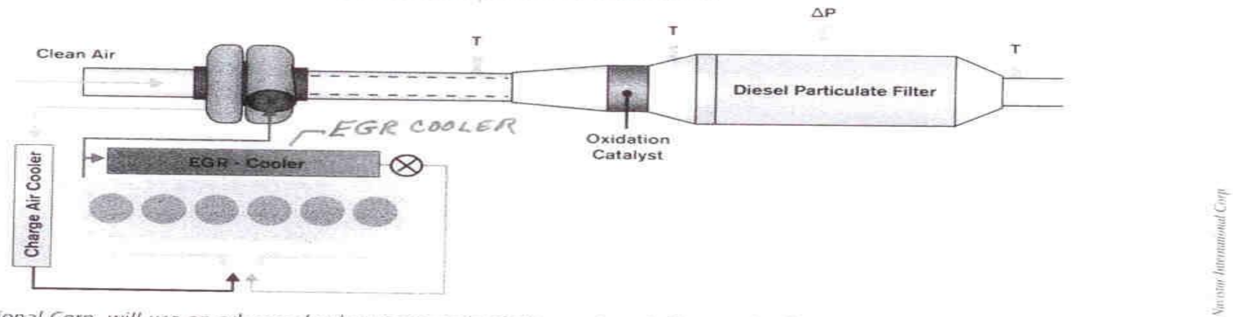
- EGR & SCR REDUCES HYDROCARBONS & NOx

- Next is CO_2
- CO_2 is Associated With Global Warming

- Regeneration
- DEF Clean \$600-\$1500, Remove & Replace \$

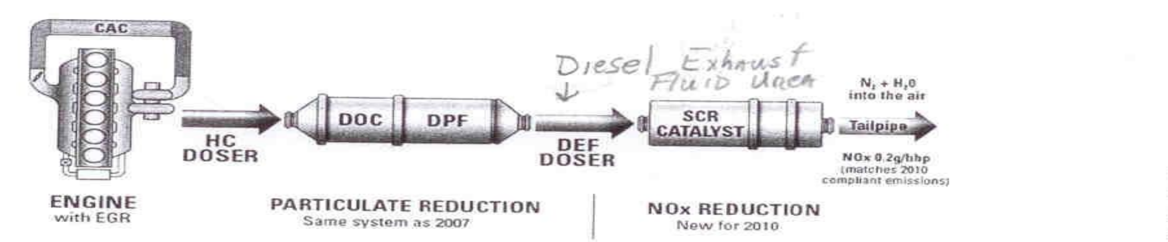
- Outsource or In House – Equipment, Skill

Exhaust Gas Recirculation



Navistar International Corp. will use an advanced exhaust gas recirculation system similar to what it uses on today's engines to meet emission standards in 2010. The EGR system recirculates a portion of the exhaust through a cooler before throwing it back into the combustion process. The 2010 exhaust systems also will continue to use a diesel particulate filter to trap soot.

Selective Catalytic Reduction



In the selective catalytic reduction system to be used on Mercedes and Detroit Diesel engines beginning in 2010, exhaust gases are treated with controlled quantities of diesel exhaust fluid — urea — after passing through the diesel oxidation catalyst (DOC) and the diesel particulate filter (DPF). This causes a chemical reaction that produces ammonia gas, which mixes with the exhaust gases. The ammonia gas and nitrogen oxide then react in a catalyst (SCR Catalyst) to form nitrogen and water.

The language of 2010 emissions control

AdBlue: A trademarked name under which urea is marketed for SCR
/stems in Europe.

Catalyst: A substance that modifies (especially increases the rate of) a
nemical reaction, without being consumed in the process.

DEF (diesel emission fluid or diesel exhaust fluid): The emissions
osing fluid that is presently used in SCR systems in Europe (under the
ademarked name, AdBlue) and elsewhere. It is comprised of 32.5%
rea and 67.5% de-ionized water. Also see Urea.

DPF (diesel particulate filter): Filter located in the diesel exhaust
ream to remove particulate matter (PM) from the exhaust. Required on
ngines starting in 2007 to meet vehicle emissions standards. Filters re-
uire the use of ultra-low sulfur diesel fuel to prevent excessive PM and
remature plugging of the filter.

EGR (exhaust gas recirculation): The technology currently in
se in the U.S. (and by some manufacturers in Europe) to comply with
andards for reducing oxides of nitrogen (NOx) emissions from diesel
ngines. In an EGR engine, some of the exhaust gas is cooled and re-
ycled back through the engine to dilute the amount of oxygen in the
ntake charge. This reduces the temperature of combustion and lowers
ne formation of NOx.

Euro emissions standards: Diesel emissions standards for EU (Europe-
n Union) countries are based upon United Nations Economic Commission
or Europe (UN ECU) standards, commonly called "Euro" standards.

HCCI (homogeneous charge compression ignition): A form
f internal combustion in which air and fuel are premixed in the cyl-
nder like a gasoline engine, but still ignited by compression as in a
iesel engine to create lower combustion temperatures and produce
ess NOx.

Hydrocarbon-SCR: Also called Lean NOx Reduction. An aftertreatment
ystem that uses hydrocarbons from diesel fuel or the exhaust stream in-
tead of ammonia to reduce NOx.

Particulate matter: Solid particles of various sizes (some much small-
r in diameter than a human hair) that are formed by incomplete fuel
ombustion and released as part of the engine's exhaust. Linked to various
ong- and short-term health problems, reductions in the particulate matter
f exhaust gas were mandated by the 2007 EPA emissions standards and
chieved using diesel particulate filters. Also see DPF and Soot.

SCR (selective catalytic reduction): A technique for reducing oxides
f nitrogen (NOx) that involves injecting a fine mist of urea plus water
also called diesel emission fluid) through a catalyst into the engine's ex-
aust stream to create a chemical reaction to turn NOx into nitrogen and
vater vapor (plus carbon dioxide, which is released as the urea converts
o ammonia during SCR).

Soot: Also called particulate matter or PM. The very fine carbon particles
hat are part of diesel particulate emissions. The "black" in engine exhaust
missions.

ULSD (ultra-low sulfur diesel fuel): Contains a maximum of 15 parts
er million (ppm) sulfur. Reducing sulfur in fuel directly reduces particu-
ate matter in the exhaust that is formed during combustion. Use of ULSD
educes particulate matter loading in the diesel particulate filter.

Urea: Carbonyl diamide $(NH_2)2CO$. Turns into ammonia and carbon
lioxide when heated during SCR—$(NH_2)2CO + H_2O$ _ $2NH_3 + CO_2$. Also
ee DEF and SCR.

Sources: Volvo Trucks NA; Chevron Oronite Co.; Diesel Progress; Other

SCR and EGR: Pros and co

While EGR and SCR are both proven paths to reducing
emissions, there are trade-offs associated with each app

SCR advantages:
- Permits more optimized combustion
- Can enable better fuel efficiency/power
- No concerns about engine durability/oil degradation
- End product is nitrogen, water and carbon dioxide
- Urea not classified as hazardous to health

SCR trade-offs:
- System adds weight
- Adequate urea supply infrastructure not yet in place
- Purchasing urea is additional cost
- System, including sensors and other compliance-related de must be maintained
- Urea freezes at 12 deg. F., so may require heated storage
- Most effective at constant speeds and high loads; least in s
- Urea (also in some fertilizers) is a water pollutant/harmful

Cooled EGR advantages:
- Does not require additional onboard hardware
- Does not require the use of an additional fluid
- No loss of payload
- No impact on service intervals
- No driver intervention necessary for compliance

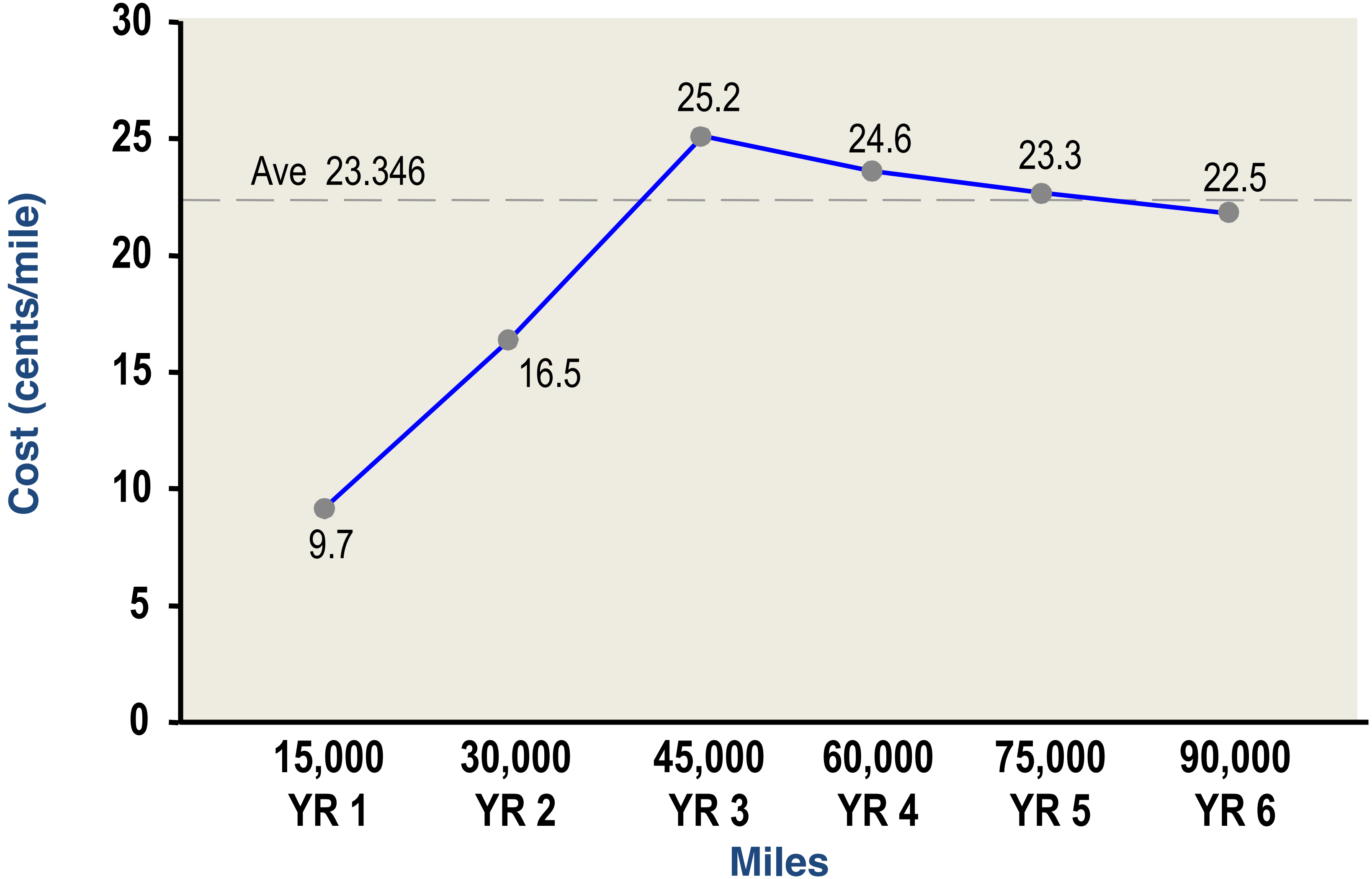
Cooled EGR trade-offs:
- Increases heat rejection, creating need for greater cooling
- Decreases power density, fuel efficiency
- Potential engine durability and oil degradation issues
- Less combustion efficiency produces increased particulate hydrocarbon, carbon monoxide

Sources: Chevron Oronite Co. LLC; Scania; VDI, Germany, "Market Overvi
haust Gas Treatment Solutions for Diesel Engines in Commercial Vehicles
ing Current and Upcoming Emission Legislation in the EU"; Volvo Trucks
For EPA '10"; Environmental Protection Agency Heavy-Duty On-Highway
Argonne National Laboratory

DPF Operating Info

- Low DEF
- Idle
- Regeneration
- Dashboard Signal(s)
- Diagnose Problem Causing Regeneration
- Clear Problem
- Interpret Information For Cause of Problem
- DPF, Clean $600-$1500, Remove & Replace $
- Outsource or In House – Equipment, Skill, Cost of Equipment, Return On Investment, Analysis

Maintenance Cost Per Year



Direct Impact Issues

- Safety, No Injuries, Conditional Maintenance
- Vehicle Configuration for Workloads
- Repair, Replace, Rebuild, Rent, Remove
- Capital & Operating Needs Based on Age
- Importance of Fleet Management Costs
- Availability & Reliability Needs Of Equipment
- Integrity of fleet funding issues
- Short term/long term effects, Workloads
- Peak and Valley funding, Passenger Needs
- Storms, Contingencies, Route Changes, Traffic Flow, Construction
- Present fleet size, mix, density and age

SUMMARY OF TYPICAL AREAS OF CONCERN

Written policies & procedures are needed for leadership & conformity.

Need for work standards and productivity measures.

Need Daily Down Accountability…Repair, Replace, Rebuild, Remove, Rent, (Sustained Reliability)

Fleet size is too large. Replaced Vehicles That Are Not Removed.

Management practices need improvement. Proactive Perspective

Utilization and availability, control measures are needed.

Supervision needs training on participatory methods.

There is a need to upgrade to forthright communication on each level.

Quality must improve.

Vehicle purchase procedures need upgrading.

Transportation organizations whether centralized or decentralized need to be defined and direction spelled out.

Work scheduling needs to be quantified on Time, Miles and Fuel Use.

Mechanics and non-mechanics and working foremen need training (technical) on new technology and methods. These is need for management by goals and objectives with rewards and discipline enforced. Recognition Programs Needed for Staff & Fleet.

Better balance is needed for in-house and vendor maintenance activity.

Scheduled maintenance programs need annual upgrading.

Cost control systems manual and / or automated varieties need to be implemented and applied to Vehicle Maintenance Management Concepts.

Thank You

Questions & Discussions

Resources Available From J. Dolce, johnedolce@yahoo.com

"Fleet Management" $35

McGraw Hill 10th Edition, 2013

J. Dolce Author

"Analytical Fleet Maintenance Management"

SAE, 3rd Edition, 2010 $40

J. Dolce Author

"Vehicle Specification & Procurement"

SAE, 2nd Edition, 2009 $40

J. Dolce Author