Management of Erie County Equipment Repairs

Erie County

LEAN SIX SIGMA PROJECT

April – October 2008

TEAM MEMBERS

- Champion: Jerry Sentz P.E.
- Master Black Belt: John Lupienski
- Green Belt: Gary Zawodzinski
- Greg Falkner – Fleet
- Jim Depcynski – Parks
- Larry Krug – Sewers
- John Zabawa – Highways
- Chuck Fiorello – DISS
- Bridget Corcoran – Budget
- Kevin Higgins – Fleet

Lean 6 Sigma Major Benefit

- Improved inter-departmental communications

DEFINE PHASE

Management of Erie County Equipment Repairs

Project Charter - Define

Strategic Goal/Business Case: Improve the sharing of equipment and vehicles to reduce spending in rental, equipment downtime and outside repairs. Also examine the Auto repair supply expenditures in all departments

Problem Statement: Determine the most cost effective repair options and facilities to address all various equipment breakdowns.

Project Objective: To maximize in house repairs which in turn will reduce costs and increase vehicle maintenance turn around time.

Project Charter cont.- Define

Benefits/Savings Potential: The Project will reduce spending costs by $300,000 on an annual basis by 10/01/09

Scope/Boundaries: Outside contracting, blacksmith work, fleet maintenance, as well as our internal controllable. All budget line items identified in cost metric. This will be accomplished without a negative impact to seasonal staff for snowplowing activities. This scope excludes all budget line items not identified in cost metric.

Timeline: April 14, 2008 to October 30, 2008

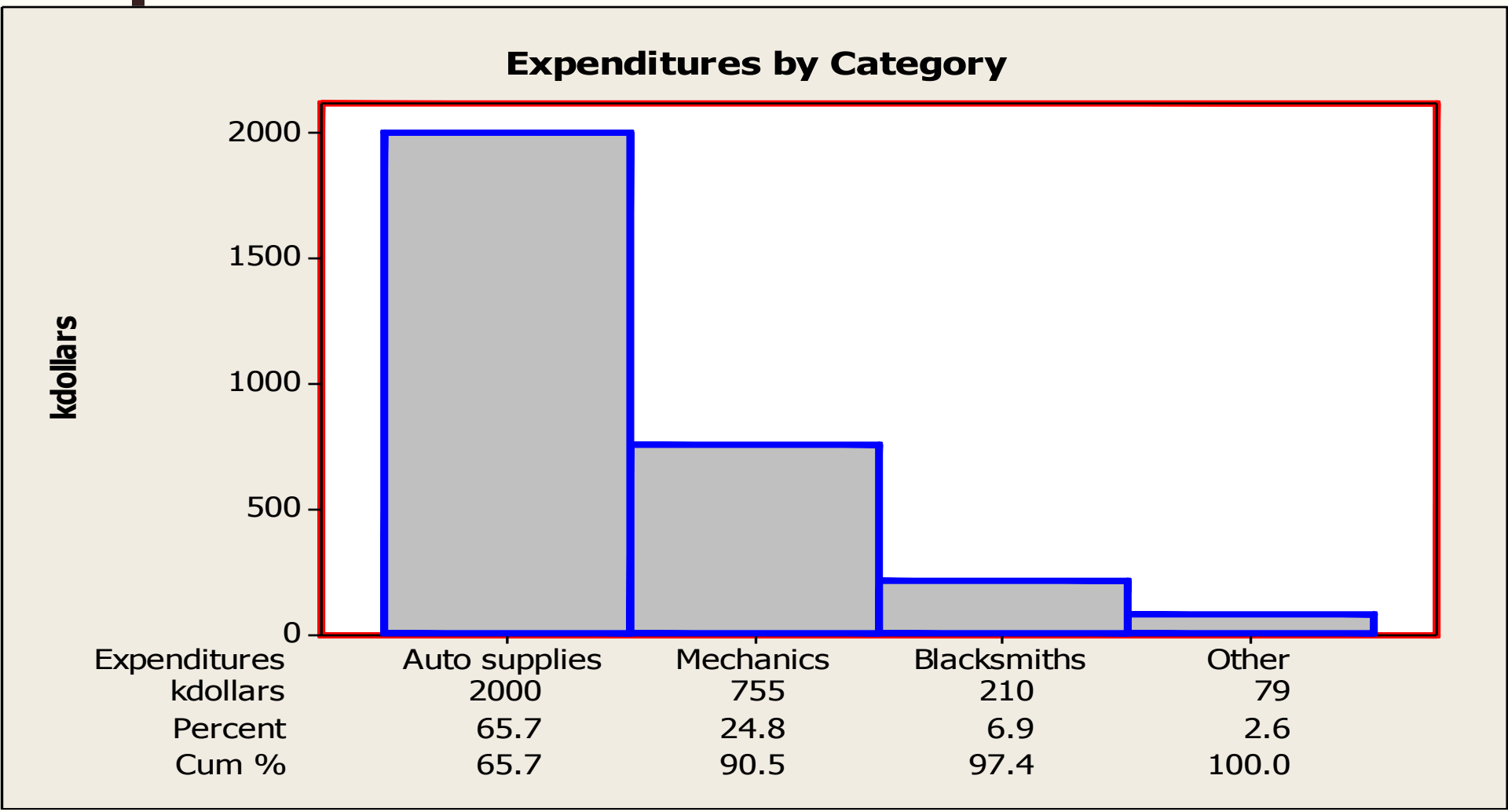
MEASURE PHASE

Management of Erie County Equipment Repairs

Measure Phase

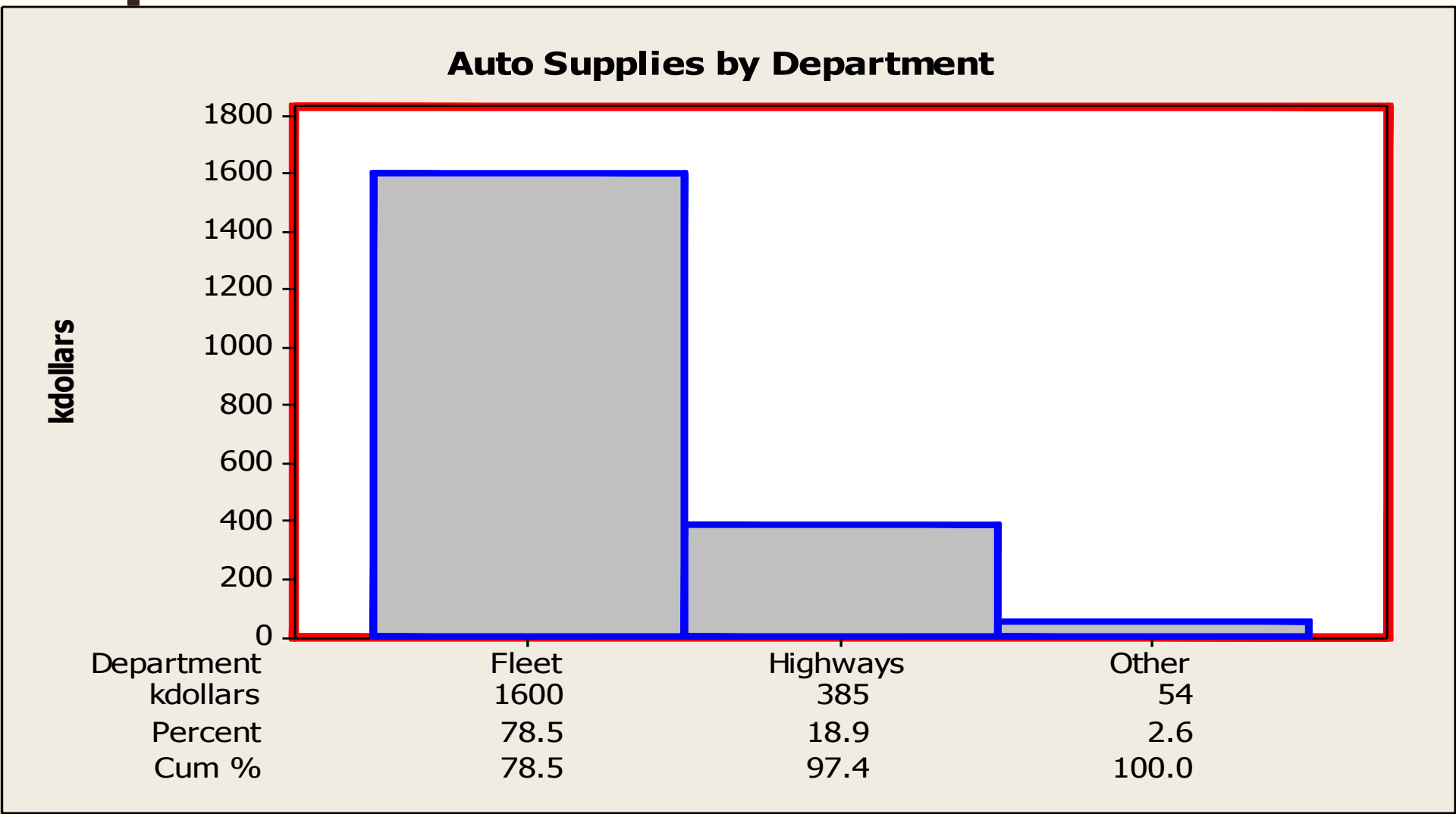
- Initial Data Analysis for Evaluation of the project was compiled in order for the team to begin to focus on the needs of the project

Measure Phase

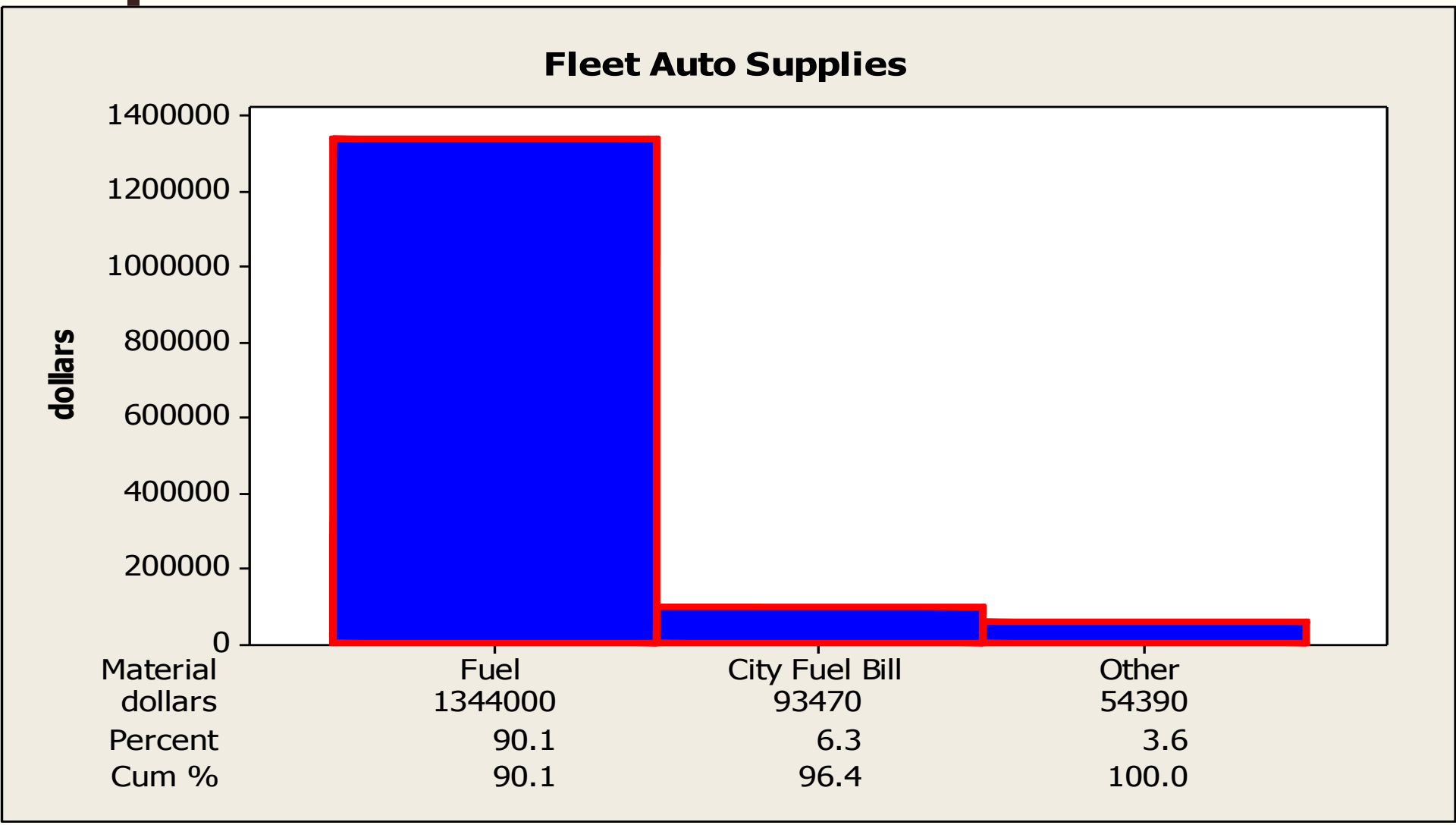


Expenditures	Auto supplies	Mechanics	Blacksmiths	Other
kdollars	2000	755	210	79
Percent	65.7	24.8	6.9	2.6
Cum %	65.7	90.5	97.4	100.0

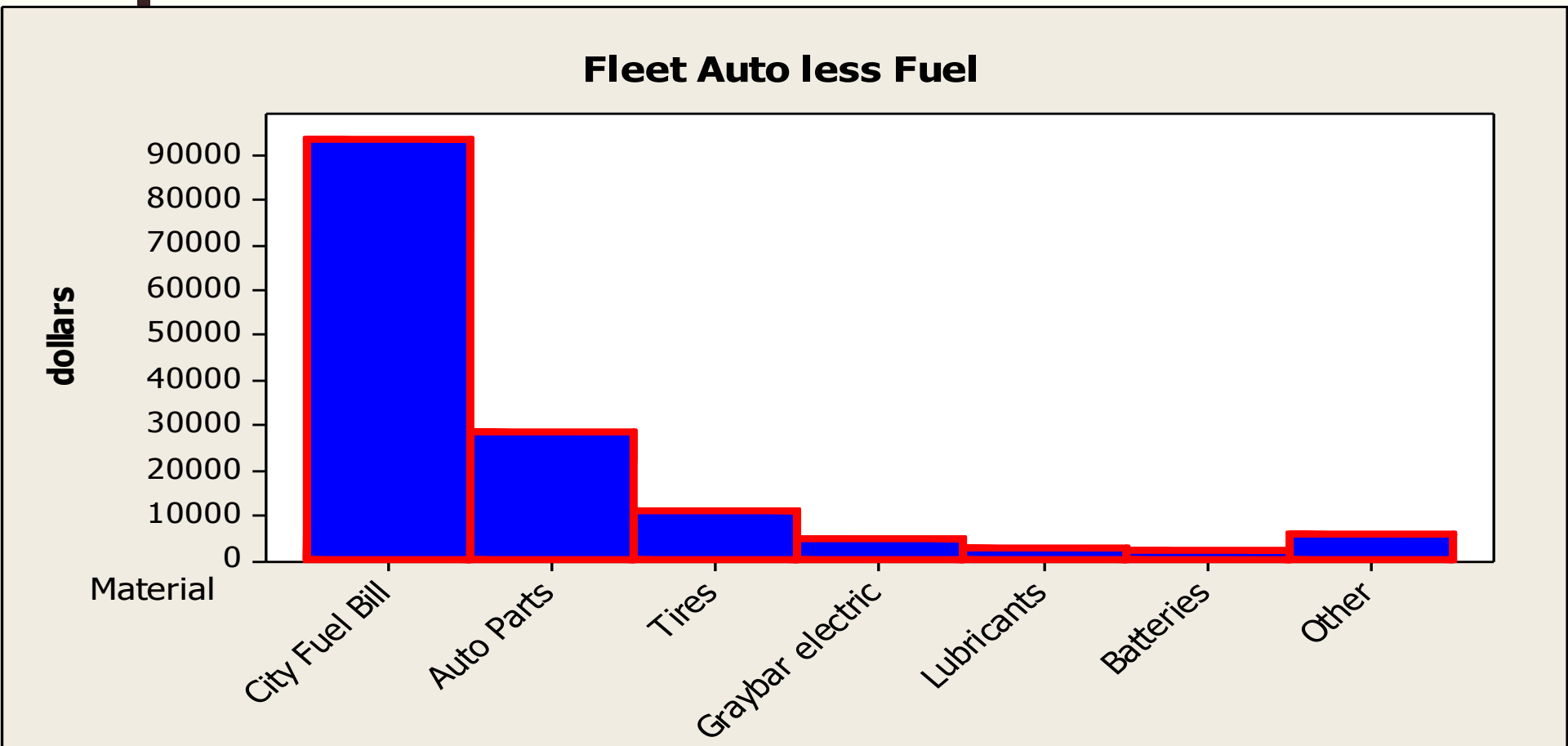
Measure Phase



Measure Phase



Measure Phase



dollars	93470	28631	10982	4720	2340	1824	5893
Percent	63.2	19.4	7.4	3.2	1.6	1.2	4.0
Cum %	63.2	82.6	90.0	93.2	94.8	96.0	100.0

ANALYZE PHASE

Management of Erie County Equipment Repairs

Weighted Voting

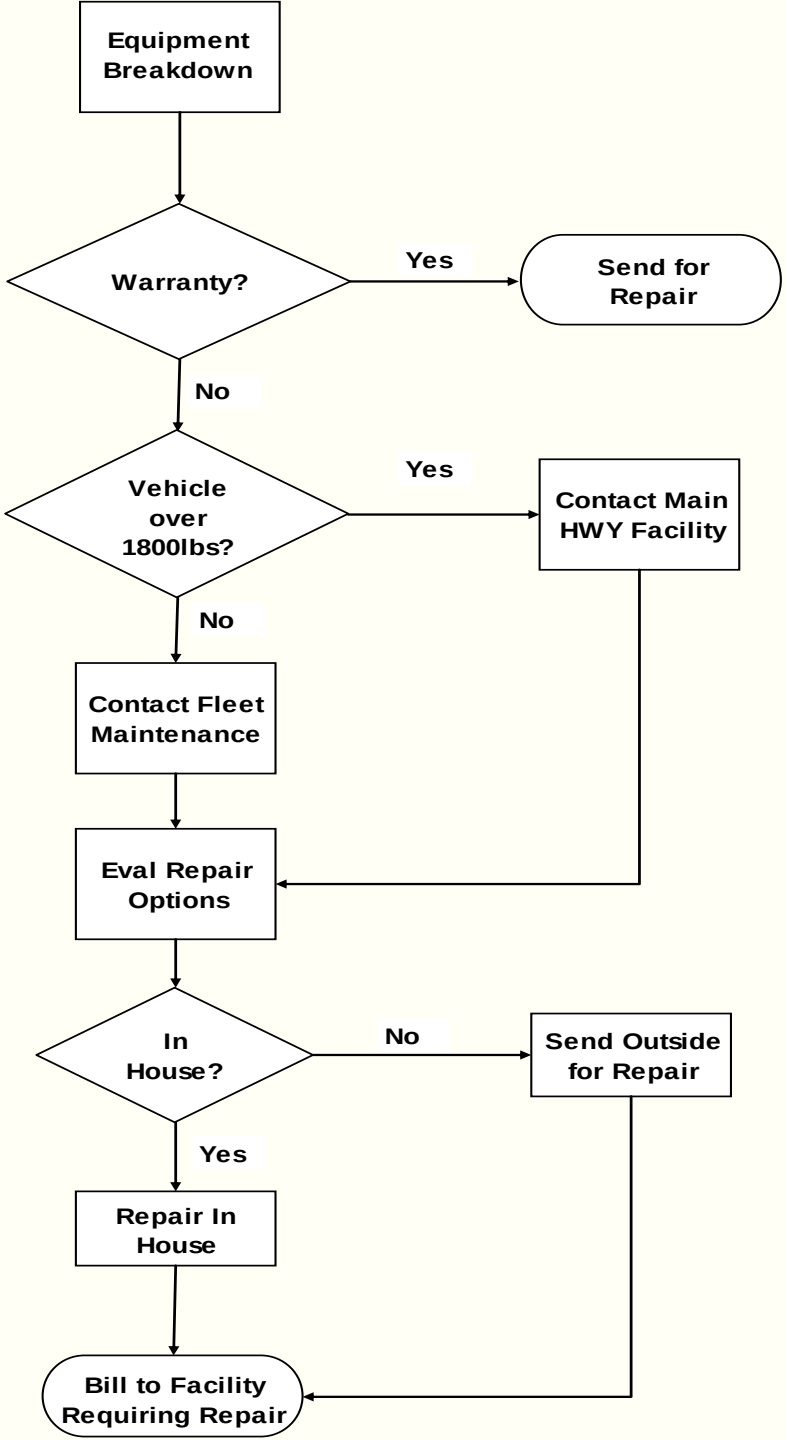
A. Consolidate Maintenance
B. Reduce Outside Repair Costs
C. Inventory Management/ Sharing of Equipment
D. Reduce County Fuel Consumption
E. Recap Tires
F. Upgrade Vehicle Age

Sub Committees

- Reduce Outside Repair Costs – John Zabawa, Jim Depcynski
- Reduce Fuel Consumption – Greg Faulkner, Kevin Higgins
- Equipment Inventory, Sharing of the Equipment – Larry Krug, Chuck Fiorello

Quick Fixes

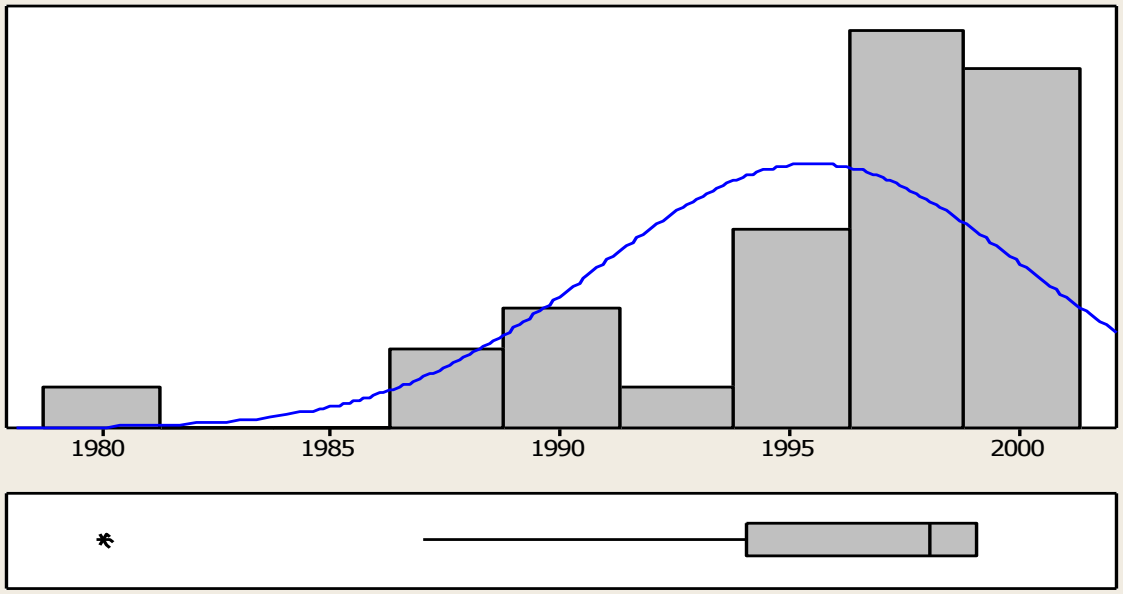
- Recap Tires – Policy letter written
- Outside Repairs – Prior approval needed
- Redistribution of Highway Mechanics

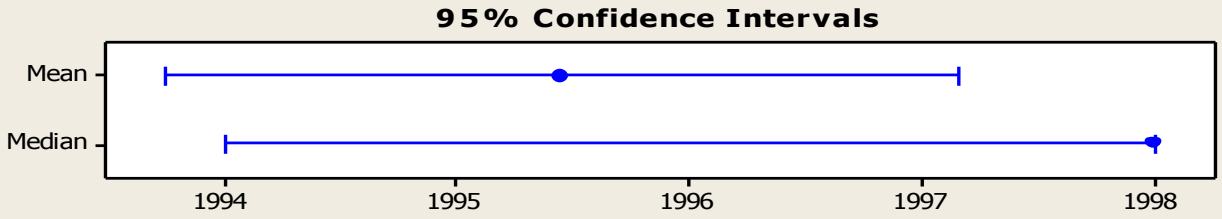


- **This is a simple process map that shows the actual Process Map that can be used real world today.**
- **The main contacts will be Fleet for smaller vehicles and Highways for larger vehicles and heavy equipment**

Vehicle Age Analysis

Summary for 2wdyear

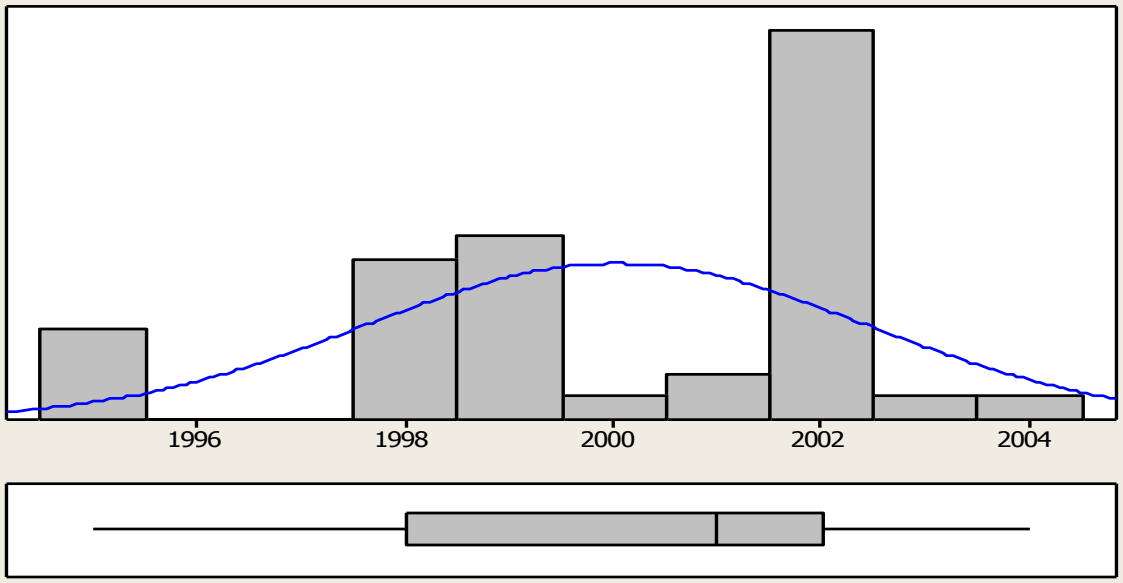


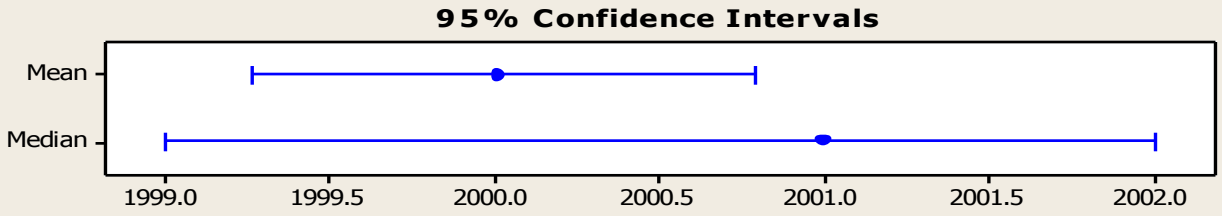


Anderson-Darling Normality Test	
A-Squared	2.66
P-Value <	0.005
Mean	1995.5
StDev	4.7
Variance	21.7
Skewness	-1.65863
Kurtosis	2.73663
N	31
Minimum	1980.0
1st Quartile	1994.0
Median	1998.0
3rd Quartile	1999.0
Maximum	1999.0
95% Confidence Interval for Mean	
1993.7	1997.2
95% Confidence Interval for Median	
1994.0	1998.0
95% Confidence Interval for StDev	
3.7	6.2

Vehicle Age Analysis

4wheel drive





Anderson-Darling Normality Test	
A-Squared	2.40
P-Value <	0.005
Mean	2000.0
StDev	2.4
Variance	5.8
Skewness	-0.666532
Kurtosis	-0.394861
N	41
Minimum	1995.0
1st Quartile	1998.0
Median	2001.0
3rd Quartile	2002.0
Maximum	2004.0
95% Confidence Interval for Mean	
1999.3	2000.8
95% Confidence Interval for Median	
1999.0	2002.0
95% Confidence Interval for StDev	
2.0	3.1

IMPROVE PHASE

Management of Erie County Equipment Repairs

Equipment Inventory

- DISS will create a shared drive
- DISS is looking into who has the expertise in-house to manipulate the Access database to do what is requested—stay tuned

Fuel Reduction

- Our goal is to save 25,000 gallons of fuel in 2009 through proper management and accountability. Department heads will be provided a monthly report to manage fuel usage. If Budget is exceeded quarterly, the department head will be required to meet with the Budget Analyst and Fleet Maintenance to accommodate Budget excedance.

Benefits/Savings Summary

In-House vs. Outsource

External Estimate (Labor & Parts)

$84,025.65

Internal Repair Costs (Labor & Parts)

$26,990.11

YTD SAVINGS of $57,035.54

(5/1 – 8/19)

Estimated Annual Savings $125K

Benefits/Savings Summary
Recap Tires

YTD SAVINGS of $7,732.24

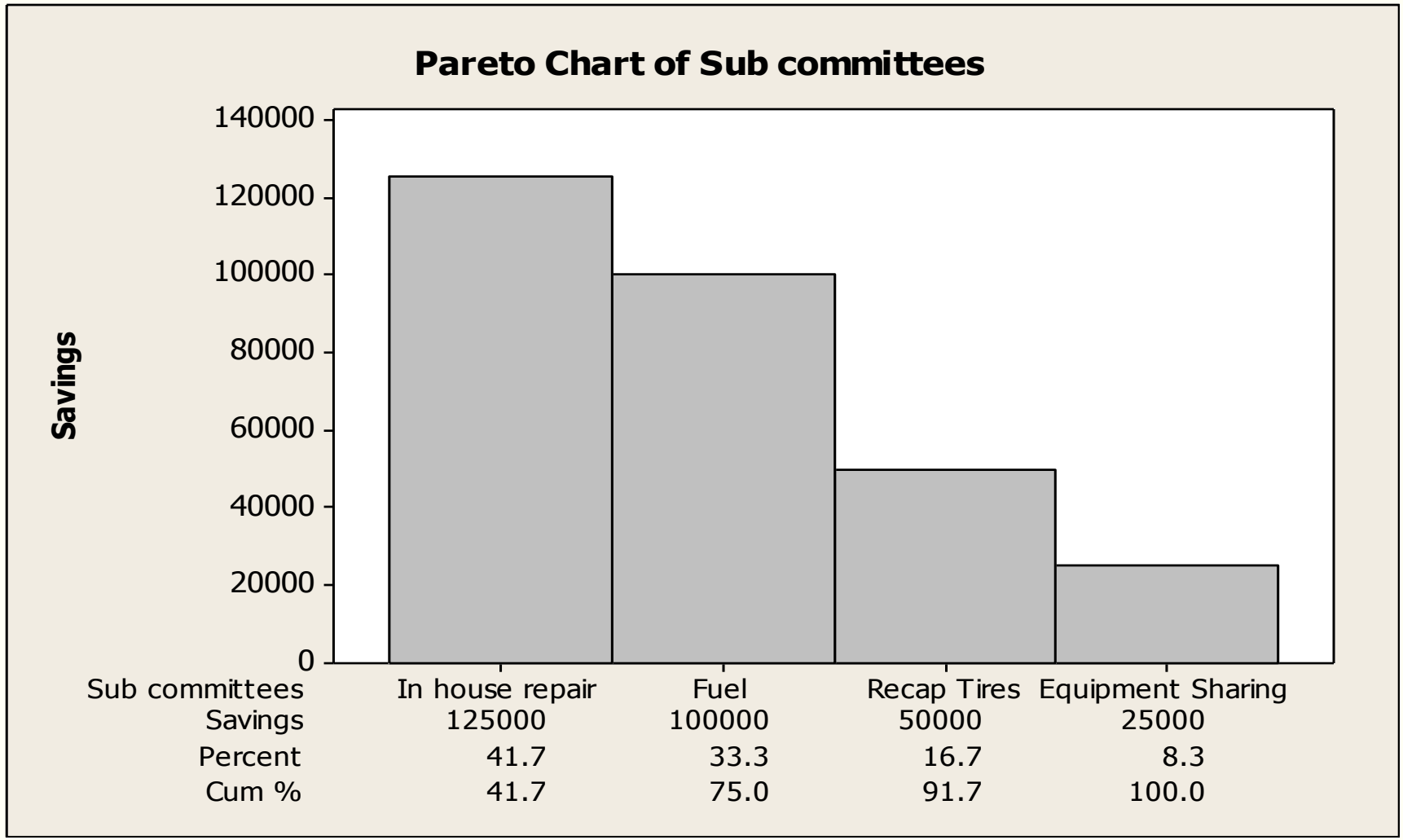
(4/1 – 8/1)

Estimated Annual Savings $50,000

CONTROL PHASE

Management of Erie County Equipment Repairs

Projected Total Savings $300K



Control Phase

Actual 2008 Highway Savings

Auto Parts - $77,000

Outside Repairs - $44,000

Total Savings - $121,000 for 6 months only

Control Phase Savings

- 2009 carryover from 2008 $242,000
- 2009 Fuel Savings + $100,000
- 2009 shared equipment + $ 25,000
- Total 2009 est. $ 367,000

- Memo to Commissioner's to control fuel consumption
- Memo for gas boy lock out
  Report generated monthly and reviewed
- Efficiency Grant to reduce fuel consumption
  New 2wd pick ups or cars – 16,000 gals @ $4.00/gal = $64,000
  New 4 wd pick ups – 8,000 gals @ $4.00/gal = $32,000
  Total savings = $96,000

NEXT STEPS

Management of Erie County Equipment Repairs

Next Steps/Barriers

- No major barriers at this time
- DISS support to accomplish shared drive
- Ongoing Fleet Consolidation

Six Sigma Tools Used

Define	Measure	Analyze	Improve	Control
✓Problem Statement	✓ SIPOC Diagram	✓ Potential X's	❑ Regression Analysis	✓ Control Methods
✓ Macro Map	✓ Process Flow Diagram	✓ Graphical Analysis	❑ DOE Planning	✓ Control Plans
✓ Identify Customers	✓ Value Analysis/ Muda	✓ Hypothesis Testing	❑ Screening DOEs	❑ Poka-Yoke
✓ Project Scope	✓ Detailed Flow (I/O)	❑ Means	❑ Quantifying DOEs	❑ SPM – Monitor Y
✓ Primary Metric	❑ Measurement System Analysis	❑ Variance	❑ Optimizing DOEs	❑ SPC – Control X's
✓ Secondary Metric	❑ Capability Analysis	❑ Proportions	✓ Verify Critical X's	❑ OCAP
✓ Consequential Metric	❑ Short Term Capability	❑ ANOVA	❑ Y = F(x)	❑ Update FMEA
✓ Baseline Data	❑ Long Term Capability	❑ Regression Analysis	❑ Optimization	✓ Project Transition Action Plans
❑ Entitlement	✓ Data Collection	❑ FMEA	✓ Generate Solutions	✓ Update Financial Benefits
✓ Objective Statement	✓ Process Monitoring	✓ ID Critical X's	✓ Select Solutions	✓ Final report
✓ Financial Estimates	✓ Lean Opportunities	✓ Quick Improvements	✓ Pilot Trials	✓ Close Project
✓ Non-financial Benefits	✓ C & E Fishbone	✓ Lean Improvements	❑ Capability Analysis	
✓ Team Members	❑ C & E Matrix	✓ Process Tracking		
❑ **Define Review**	❑ **Measure Review**	❑ **Analyze Review**	❑ **Improve Review**	❑ **Control Review**