City of Dallas

TMAC
TEXAS MANUFACTURING ASSISTANCE CENTER

# ISO 9001:Quality Management System
# *Implementation Status Report*

***Presented to***

**Quality of Life Committee**

**Department of Street Services**

*November 28, 2005*

# Purpose

- Provide an overview of the Department of Street Services Maintenance Activities
- Discuss objectives of ISO 9001
- Provide Status and Project Review of ISO 9001

# Street Services Overview

- $47M budget and 584 employees
- Configured into four major areas of responsibility:
  - Flood Control
  - Five (5) Service Maintenance Areas
  - Contract Maintenance Services
  - Focus **<u>Street Repair Division</u>** Focus
    - ISO 9001 focus area

# Flood Control

- Storm Water Funded
  - $7M FY2005-06
- Provide flood protection by maintaining and operating the Trinity River Levee System (completed in 1931)
  - 30 miles of levees
  - 16 Pump Stations
    - 63 pumps
      - 2.8 billion gallons per day pump capacity
  - Protects 10,000 acres of real-estate comprising 17% of the City's tax base
- Monitor 41 Flooded roadway warning sites on roadways prone to localized flooding
- General Maintenance of the following:
  - 117 miles of creeks
  - 51 miles of lined channels
  - 58 acres of Detention/Retention Basin
- Mowing
  - Floodway two (2) times a year
  - Levees four (4) times a year
  - Sumps two (2) times a year

# Service Maintenance Areas

**Primary Intake Of Service Requests (311)**

- Routine Maintenance
  - Pothole repair
  - Radio dispatch for roadway emergencies
  - Street/Alley repair
  - Roadside drainage
  - Inlet Cleaning
  - Illegal dumping
  - Guardrail repair
  - Mowing surplus property
- Night Operations
  - Fire response
  - Right-of-way cleaning in CBD district
  - Sanding Oil Spills
  - Traffic control at accidents

# Contracted Maintenance

- Mowing of medians and rights-of-way
  - 1600 acres per cycle
    - 18-19 cycles annually
- Street sweeping for major thoroughfares
  - 2,186 gutter miles monthly
- Litter Pick-up
  - Removes 1,500 cubic yards of litter annually
- Preventive Maintenance Treatments
  - Slurry Seal for residential streets
    - Sealant to prevent water infiltration
    - 60 lane miles/annually
  - Micro surfacing for high traffic thoroughfares
    - Sealant to prevent water infiltration
    - Provides greater traction
    - 120 lane miles

# Street Repair Division
## *"The Company"*

- Types of major maintenance repairs
  - Partial Reconstruction (concrete only)
    - the removal and replacement of large, failed sections of concrete streets. The process includes breakout and removal of the old pavement section, repair of any existing base failures and the placement of new concrete in the failed areas where the remaining street is still in good condition.
  - Rehabilitation
    - a treatment for asphalt streets *without* curb and gutter. The street surface is first repaired, crack sealed if necessary, and seal coated. A 1-1/2" to 2" layer of hot mix asphalt is then applied.
  - Restoration
    - involves grinding and pulverizing an asphalt street and recycling the old base and surface material into the base of the new street. After the recycled material is placed and compacted, an under seal is applied followed by a 1-1/2" to 2" layer of hot mix asphalt.
  - Full-Depth repairs
    - Partial replacement of street/alley pavements

# Quality Management System

- On February 23, 2005, the City approved a professional service contract with The University of Texas at Arlington [Texas Manufacturing Assistant Center] to provide consulting services including development of policies, procedures, work instructions, records and forms and follow-up audits to implement a ISO 9001 Quality Management System within the Street Repair Division [“The Company”] of Street Services.

# What is ISO 9001?

- ISO 9001 is an **internationally recognized quality management standard** that is applied to several types of organizations designed to implement **a closed-looped network of processes resulting in an effective, efficient, and customer oriented management system model**.

# What Are We Trying To Achieve?

- Understand the business model in place at "The Company"
- Use ISO 9001:2000 as a platform to **develop and implement an effective business model**
- Assist with improvement opportunities identified during this process, utilizing TMAC's past experiences to provide insight and ensure success
- Improve efficiencies
- **Waste reduction**
- Utilization of standard construction practices (repeatable and consistent processes)
- **Ensure department set and goals are met**
- Provide accountability
- Establish a progress reporting method IE: Project List

# Snapshot Of What We Observed In The Beginning

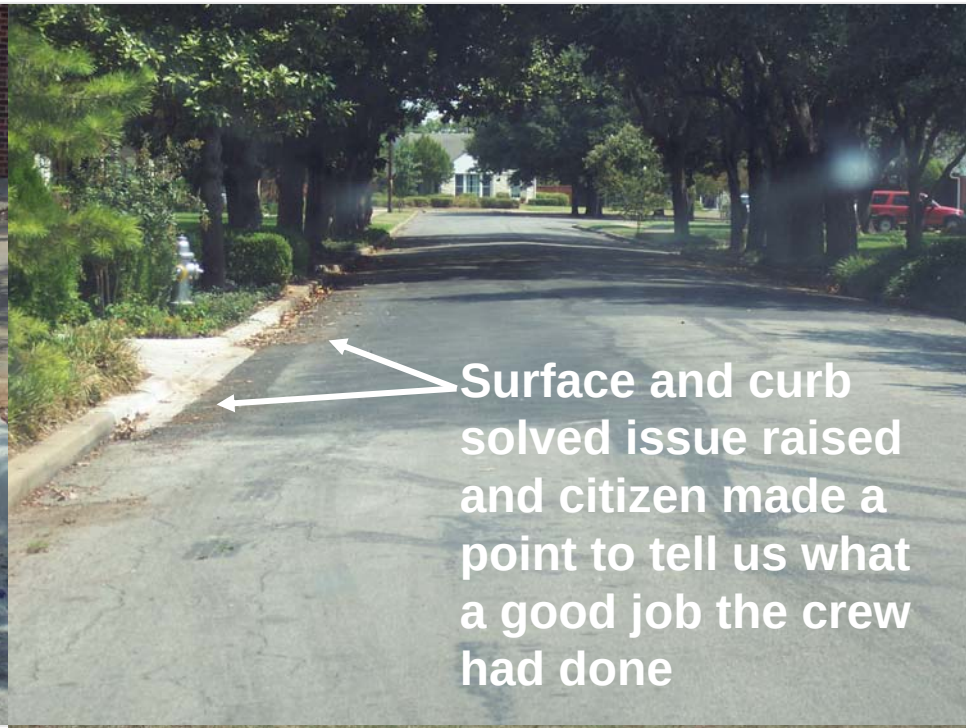
Positive Things We Have Seen

- People taking initiative (Gradall operator using down time to maintain equipment & asphalt delivery driver helping crew spread asphalt)
- Crew leaders know how to do all aspects of the job and appear to be capable of resolving all issues in the field
- Those operating equipment, appear to be well trained

Things We Saw Needing Attention

- Crews lack initiative, waiting on crew leader's direction for every move
- Sitting or standing around for extended periods of time
- Did not see Field Managers in field
- Lack of data collection and analysis (efficiency, quality, on-time delivery, etc.)
- Lack of coordinated effort (i.e., fill added to an area that was to have additional excavation)
- Lack of effective internal communication and documented feedback on job performance
- Lack of consistent and repeatable processes

# Auditing To Ensure The Plan Is Effectively Implemented

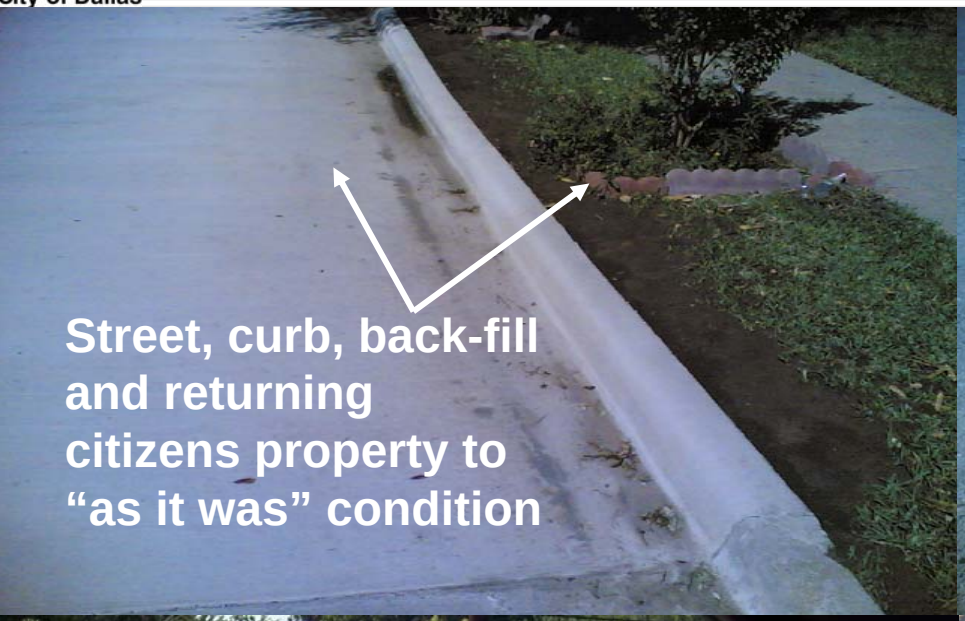




Things We Are Doing Right

- Status of jobs in work was for the most part as described in the Master Schedule
- Work done brought the street back to good condition

# Auditing To Ensure The Plan Is Effectively Implemented

(more things we are doing right)






# Auditing To Ensure The Plan Is Effectively Implemented

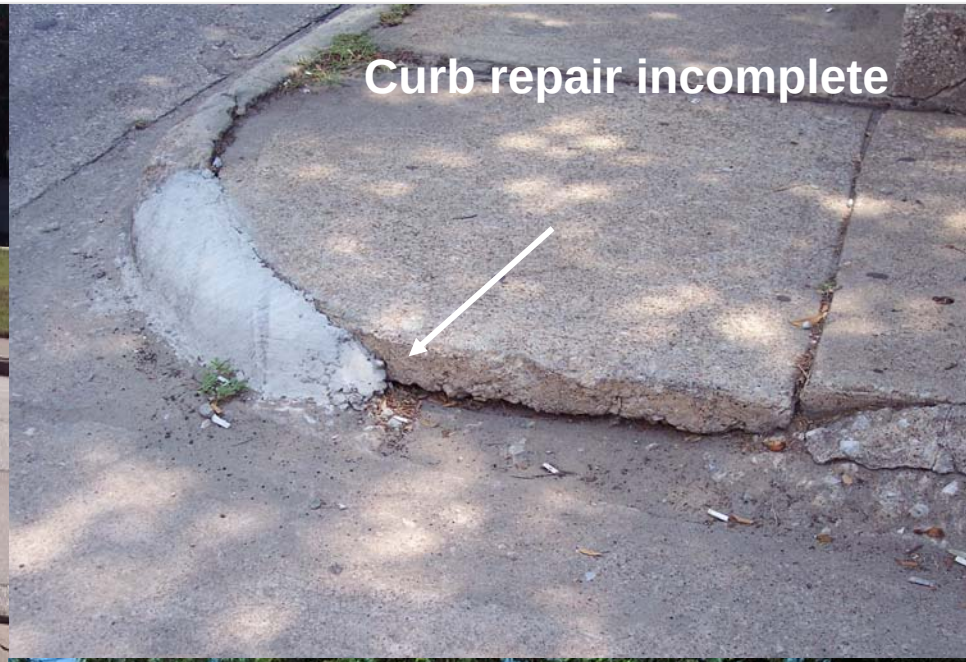



## Opportunities For Improvement

- Incidents where work was incomplete even though schedule showed it done show a hole in the final inspection process
- Fulfilling the plan at the site was at times incomplete or lacked foresight

# Auditing To Ensure The Plan Is Effectively Implemented

(more improvement opportunities)



# TMAC Quality Management System
# Implementation & Registration Process

✔ Meet Company leader
Tour Facility
QMS Assessment
Explain TMAC approach.

✔ Understand Company Expectations and Vision.

✔ Prepare Statement of Work and Project Schedule

✔ Get buy-in and sign contract.

**Project Plan** *specifically designed to meet your needs*

✔ Present QMS overview to company personnel

✔ Create company goals, objectives, and quality policies. Start management reviews

✔ Flow chart mfg processes one-on-one with process operators.

✔ Determine compliance & areas for process improvement

✔ Develop procedures and work instructions for processes, e.g. PM, calibrations, purchasing, etc.

✔ Review procedures and work instructions for accuracy and completeness with personnel and get buy in!

**Complete QMS Policy Manual** *Personalized* for your company

Currently what we are working on!

✔ Train personnel on procedures and work instructions

✔ Select and train internal auditors ( ~10% of workers). Conduct QMS internal audit.

✔ Implement system: PM, corrective action, internal quality audits, training, mgmt reviews, calibration, and statistical techniques.

Conformance assessment to verify effective implementation

Work with company personnel to correct non-conformances.

**Implement a system that works**

**REGISTRATION!**

Evaluate process for opportunities for continuous improvement

Evaluate resources for training, equipment, and staffing needs.

Conduct regular management reviews:
*customer satisfaction
*internal quality audits
*corrective/preventive actions
*goals and objectives
*objective evidence of results

**Continuous Improvement**

# Initial Return On Investment

- A **documented quality management** system, defining "The Company Way"
- Improved internal **communication**
- **Consistent and repeatable processes**
- Customer feedback showing signs of increased **customer satisfaction**
- Corrective and preventive action systems to facilitate **continual improvement**
- **Employee buy-in** through training and involvement

# Next Steps

- TMAC will conduct internal quality audits as required by the ISO 9001:2000 standard one year after implementation
- Street Repair Division will perform quarterly self audits to identify nonconformance and initiate corrective/preventive actions
  - TMAC trained approximately 25 managers and supervisors to perform audits designed to maintain/improve upon an effective business model

# Where Do We Go From Here?

- Implement ISO 9001 throughout the entire Department of Street Services.
- Provide additional training to employees
  - Promote employee buy-in at all levels.
- Perform audits to verify effective implementation, while facilitating continual improvement.

# Appendix

*Process Charts*

*Continual Improvement Tools*

# About TMAC

The Texas Manufacturing Assistance Center (TMAC) works with a wide variety of organizations, delivering training, providing technical assistance, and implementing best practices with an emphasis on lean principles, strategic management, and quality, environmental, and safety management systems.

**Supporting the competitiveness of Texas by focusing on firms committed to continuous improvement and a willingness to invest in their own future!**

A Technical & Business Resource To:

- Streamline processes
- Optimize operations
- Integrate today's technology
- Increase global competitiveness
- Enhance workforce development

Of the more than 575 companies we have worked with, here are a few you may recognize:

- Motorola
- Pilgrim's Pride
- City of Waco
- City of Garland
- University of Texas Arlington

City of Dallas

# Process Improvement Form

TMAC TEXAS MANUFACTURING ASSISTANCE CENTER

PIF # : 1 0 4 Issued by: Tony DeLaCruz

Usually 5 days from the issue date, but may be longer if deemed necessary.

Issue Date: 9/26/2005 Assigned to: Johnny Bannister Due Date: Sept. 30, 2005

***Defect / Issue: (What is the problem, potential problem, or opportunity for improvement?)*** *Crew performing milling work at 11700 Denton Drive under 635 on September 18, 2005 hit man hole cover and caused damage to the milling machine # 262631. The storm sewer manhole it hit was covered with 2" inches of existing paving and the crew wasn't aware because it had not been marked by dig tess.*

***Root Cause and/or Results of Investigation: (Why did the problem occur, what may happen if something is not done, or how will we benefit from the improvement?)*** *Investigation of the incident revealed the cause to be the manhole was not on any of the current Storm Sewer locator maps nor was it on the D.W.U. line locator website maps. The crew has a metal detector but it was determined to be too sensitive and would indicate any metal objects for example coke tops or objects that would not indicate a true reading for a possible manhole. The inability to locate all hidden manhole covers may result in milling machine being damaged more severely.*

***Action to be Taken / Justification for No Action Taken: (What are we going to do about it, when will it be done, and when will we follow-up to verify effective implementation?)*** *We have researched industry standards and purchased a metal detector specifically designed for this type of usage.Staff been trained on its use and It has been used on several project with good results. Additionally, the following procedures are now in place and must be completed within 3 days of the start of the project: 1. Identify the location of Storm Sewer manholes thru the utilization of the Department's Storm Sewer Closed Circuit Cameras crews ( only when conflicts occur and storm sewer GIS maps. 2. Identify the location of Water Utility manholes and valves by utilization of the DWU website. 3. Physically check location with a metal detector specifically designed for this purpose. 4. Request Dig Tess for line locate for all other utilities. 5. Mark all locations identified thru the preceding processes.*

***Additional Preventive Action / Opportunity for Improvement: (How can we apply this knowledge to other areas [not related to the original issue] to prevent similar problems or make additional improvements? [If you cannot think of anything, just leave it blank, and thanks for trying.])*** *Additional Preventive Action will be to notify utility companys of any conflicts of what is on the maps and what we actually find on location, so they may update their maps. We will conduct on site visual inspection of each project's limits and mark all Manholes and Valves. Also we will request a map from our department's GIS coordinator on all street segments to be milled*

**Assessment / Comments [ISO Management Rep or a member of management]:** ***(How well did it work, based upon the results of the action taken?)*** *We will report back on the effectiveness of the corrective action by October 28, 2005. 10/28/05, Measures have been effective. We have been able to find manholes that were covered, not marked but on the map. We will continue to use all procedures established above and re-evaluate after 20 lane miles milled*

*May be done at Management Review, but can be done at any time. In either case, provide a copy or prepare a summary (may be part of a combined summary of all closed PIF's) for Management Review.*

Implemented? [x] Effective? [x] Yes [ ] No Closed by: Tony DeLaCruz Date: On going

*(Completed by a member of management once the Corrective/Preventive Action or Opportunity for Improvement has been completed. If you answer "No" to the "Effective?" question, the Action to be Taken or a Justification for No Action Taken needs to be included or attached to this form. This action/justification may be written on the back of this form, an attached memo/note, or recognition of another Process Improvement Form written to re-address the issue.)*

Here is an example of the closed-loop processes employed

# The Plan In Action

| Treatment Type | Street | From | To | Direction | Boundaries | Service Request or Job Number | Status | Estimated % Complete | Projected Start Date | Actual Start Date | Projected Completion Date | Actual Completion Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slurry Seal | 7th St. | 300 | 300 | E | Patton to Denver | | Open | | | | | | |
| Micro Surface | Atwell St. | 3600 | 3800 | | Lemmon to Bordeaux | | Open | | | | | | |
| Partial Reconstruction | Jim Miller Rd. (N) | 500 | -- | | Elam to north of Elam at 599 Jim Miller | 3421PRC0041 | Open | 10% | 10/11/05 | 10/11/05 | | | 1) DWU Pipeline project in next block, this project is on hold. 2) Will continue to attempt to get a completion date from DWU. 3. Tony will follow up with DWU. 4. Water has progressed in their project where we can schedule the work (td8-19). School began and work is planned in front of the school. Will postpone until school is out |
| Restoration | Alex | 2900 | 2900 | | Childress St. to Nolen | | Open | | | | | | |
| Rehabilitation | Acorn Ct. | 5800 | 5800 | | Record Crossing to Chattanooga | | Open | | | | | | |
| NIP | E. Waco/Lynnhaven | 1400<br>1400 | 1700<br>1500 | | Side walk replacement program | HU342111666 | Open | 15% | 09/15/05 | 09/15/05 | 12/30/05 | | |
| Add-Slurry | Glenhurst Dr | 6707 | | | Oak Point to dead end | N/A | Open | | | | | | |
| Additional Work | Denton Drive | 11800 | 12100 | | I-635 north to city limits Restoration Per Asst. Director | 3421DENT002 | Open | 50% | 08/01/05 | 08/01/05 | 09/17/05 | | Reduced overtime and equipment breakdown caused paving delays rescheduling 9-30. Milling machine down reschedule to 10-14. Additional problem found with the milling machine project now is rescheduled 10/30 |
| Service Request | Clearhaven Cir | 6699 | | | | 05-00305658 | Open | 90% | 09/20/05 | 09/20/05 | 10/28/05 | | Additional service request work. |

Master Schedule

- AD maintains, adding projects as they arise (new year plan, 311 calls, etc.)
- AD & Field Managers update to reflect current status at the end of each day
- AD & Field Managers sustain 2 week rolling calendar
- Planning sends out Estimators for items 3 to 4 weeks out, based on priorities provided by the AD and Field Managers

# More Of The Plan In Action

| Treatment Type | Street | From | To | Planning Manager | Estimator/Inspecting | Survey By | Date Survey | Cut Permit Received | Excavation Manager | Excavation Supervisor | Dig Tess | Excavation | Paving Manager | Paving Supervisor | Forms (concrete) | Paving (concrete) | Asphalt | Marking/Striping | Barricade Removal | Final Inspection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slurry Seal | 7th St. | 300 | 300 | Anderson | | | | | Johnson | | | | Bannister | | | | | | R | R |
| Micro Surface | Atwell St. | 3600 | 3800 | Anderson | | | | | Johnson | | | | Sheffield | | | | | | R | R |
| Partial Reconstruction | Jim Miller Rd. (N) | 500 | -- | Anderson | | Dowdy | 10/11/05 | | Johnson | Magana | 10/10/05 | A | Moody | Derden | | | N/A | N/A | R | R |
| Restoration | Alex | 2900 | 2900 | Anderson | | | | | Johnson | | | | Bannister | | | | | | R | R |
| Rehabilitation | Acorn Ct. | 5800 | 5800 | Anderson | | | | | Johnson | | | | Sheffield | | | | | | R | R |
| NIP | E. Waco/Lynnhaven | 1400<br>1400 | 1700<br>1500 | Anderson | | R | R | 09/15/05 | Johnson | Magana | 09/15/05 | R | Bannister | Salinas | R | R | R | N/A | R | R |
| Add-Slurry | Glenhurst Dr | 6707 | | Anderson | | | | | Johnson | Magana | | | Sheffield | Davis | | | | | R | R |
| Additional Work | Denton Drive | 11800 | 12100 | Anderson | | R | A | 07/28/05 | Johnson | Magana | 07/28/05 | R | Bannister | Harvill | N/A | N/A | R | R | R | R |
| Service Request | Clearhaven Cir | 6699 | | Anderson | | Dowdy | 9/15/05 | 09/16/05 | Johnson | Magana | 09/16/05 | 09/26/05 | Bannister | Harvill | 10/11/05 | 10/12/05 | A | N/A | R | R |

## Master Schedule (continued)

- Includes all of the main steps of each project, ensuring we have an up-to-date picture of our progress.

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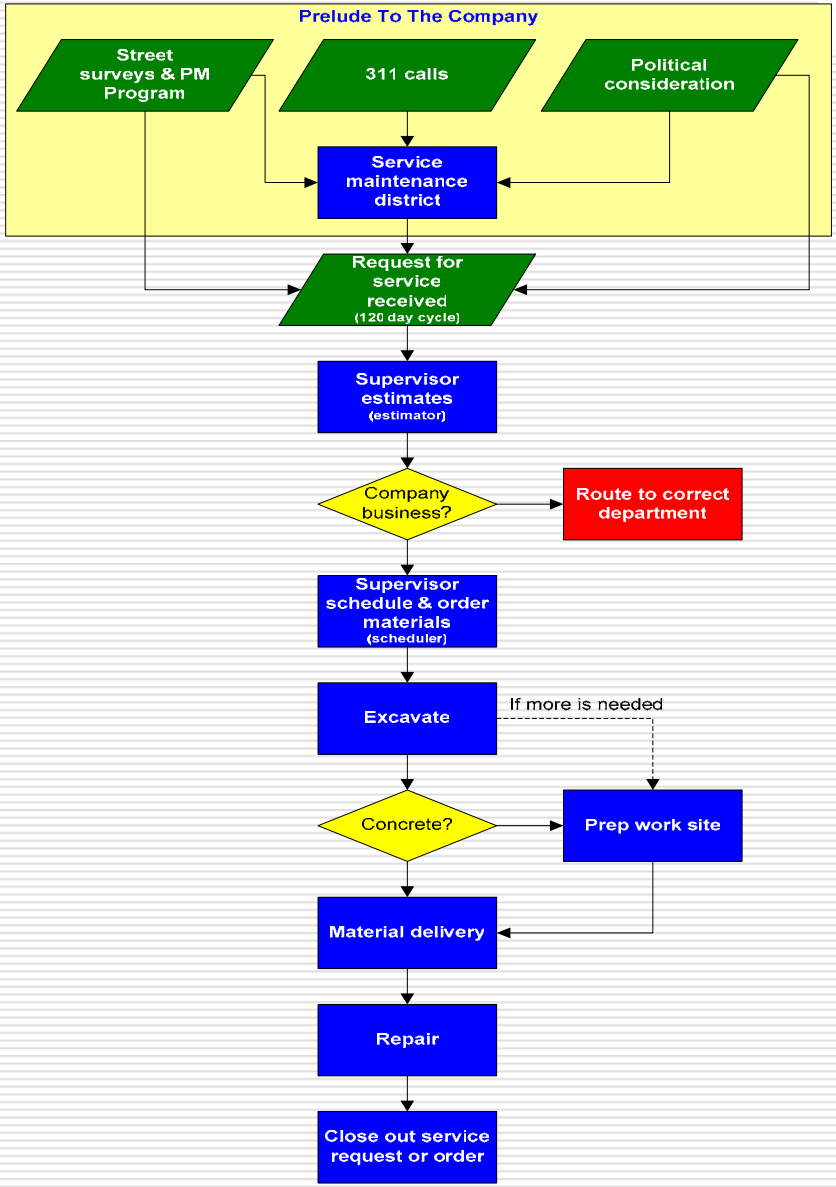
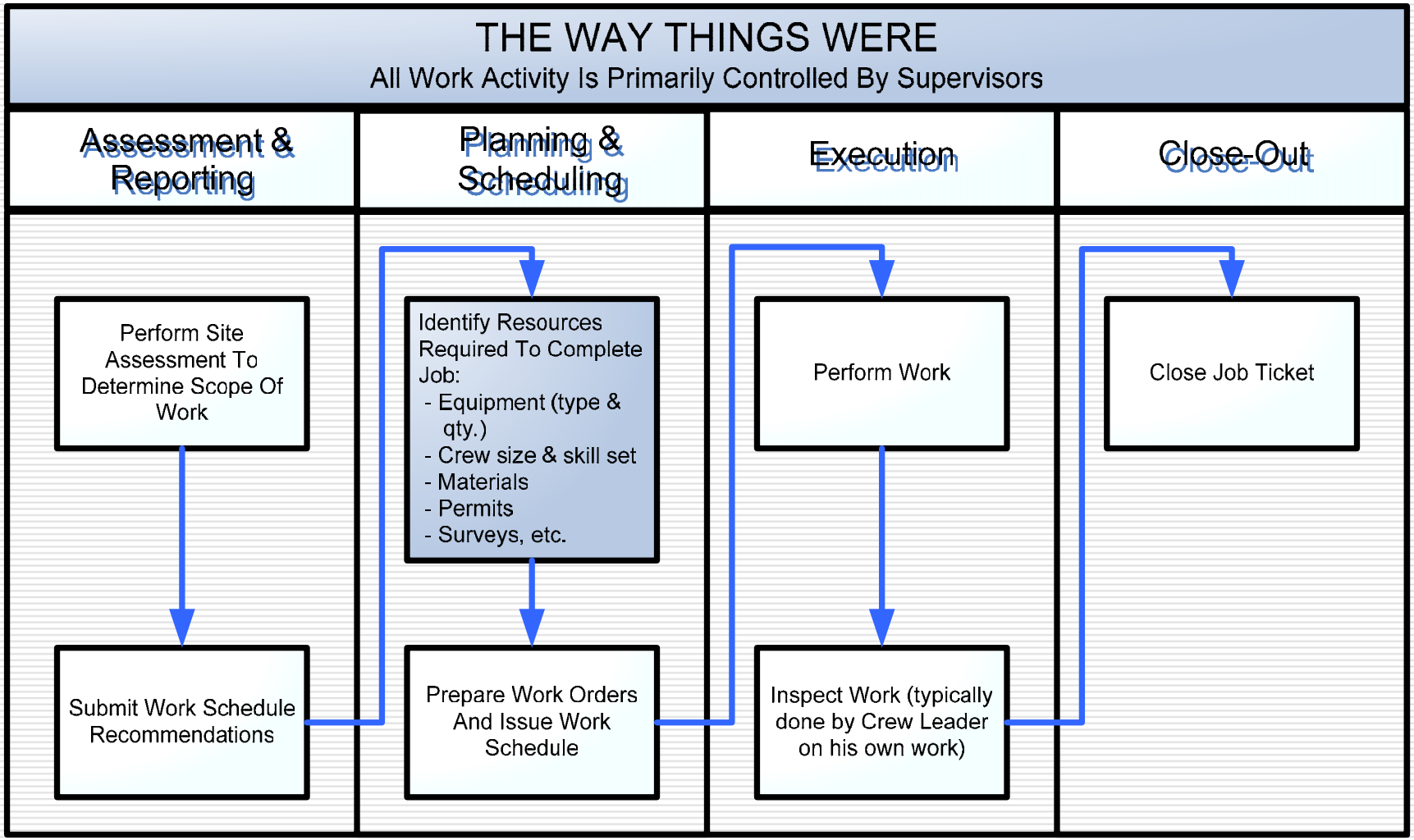
# Started Out Mapping The Organization As It Was



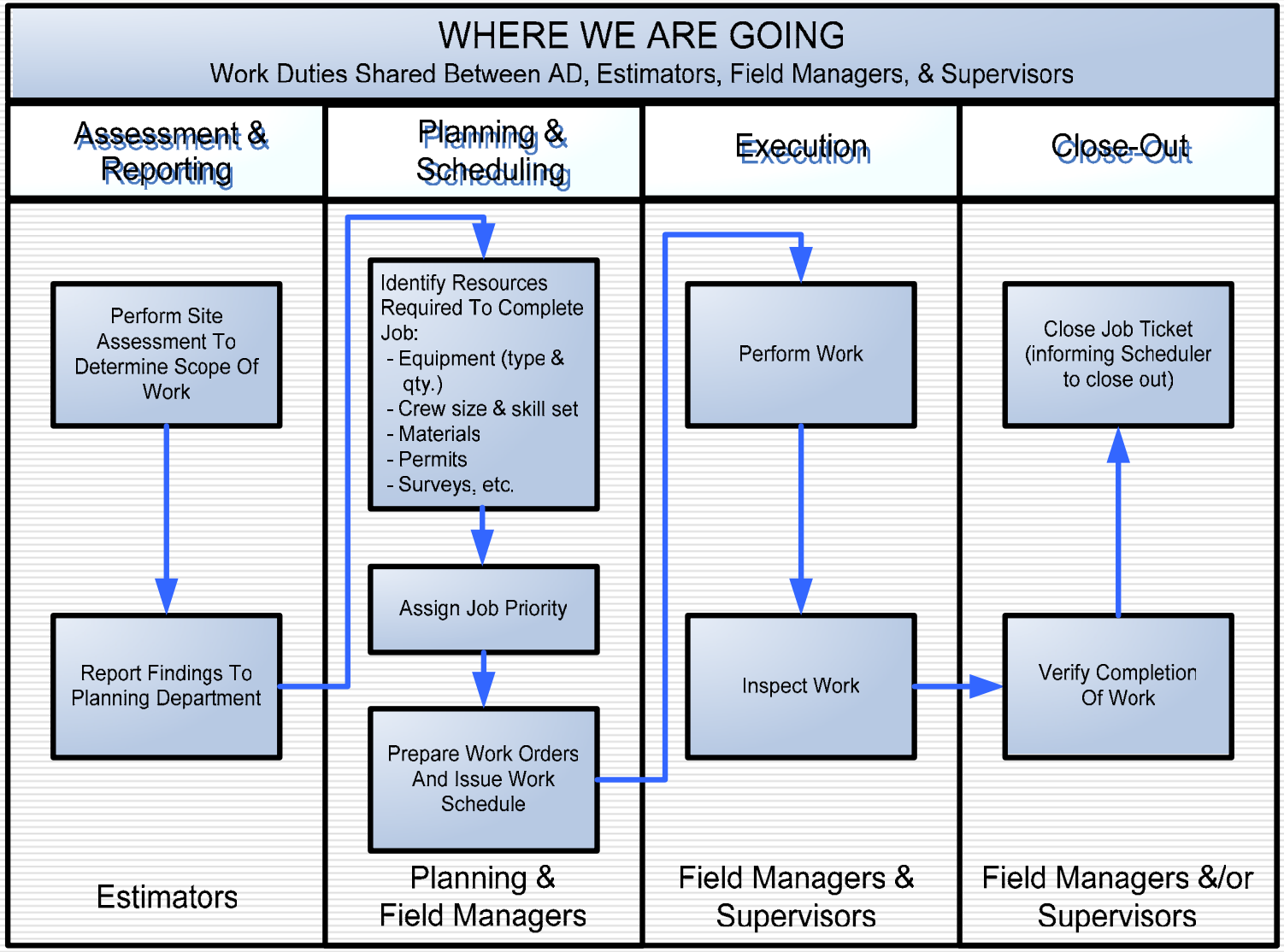
# High Level View Based On Observation



# Letting the evidence speak for itself, our observations led to the following realizations

| | Improvement Opportunity | Cause | Effects |
|---|---|---|---|
| 1 | Lack of standard work methods | ☐No documented procedures<br>☐Each work crew decides how work will be performed | ☐Best practices not used by all crews<br>☐Training needs are unclear<br>☐Significant variations in quality of completed work |
| 2 | Priority work is not completed on-time per schedule | ☐Supervisors independently schedule or recommend what jobs to work on | ☐Lower priority jobs are schedule ahead of jobs with a higher priority<br>☐Budgeted projects are not completed by year end.<br>☐Unfinished work impacts future budgets and work schedule<br>☐Subcontractor work must be rescheduled |
| 3 | Key performance measures have not been identified and performance is not being monitored | ☐Current operations lack measurements to support accountability (percent complete to date, started to closed or response time, etc.) | ☐Management control is compromised |
| 4 | Progress reporting methods do not satisfy the reporting needs of management | ☐Lack of an agreed upon reporting format and no continuity for planning | ☐Inability to accurately status projects and take necessary action |
| 5 | Material waste | ☐Inaccurate or no estimates of the amount of material needed for each job (asphalt, concrete, etc.)<br>☐Delivery trucks unable to store unused material | ☐Added costs<br>☐More pick-up and delivery travel time<br>☐Equipment wear<br>☐Crew down time |
| 6 | Equipment utilization | No standard method for assigning equipment to match job needs | Overall efficiency is lost as equipment is not matched to the job requirements |

# High Level View Of What We Are Pursuing



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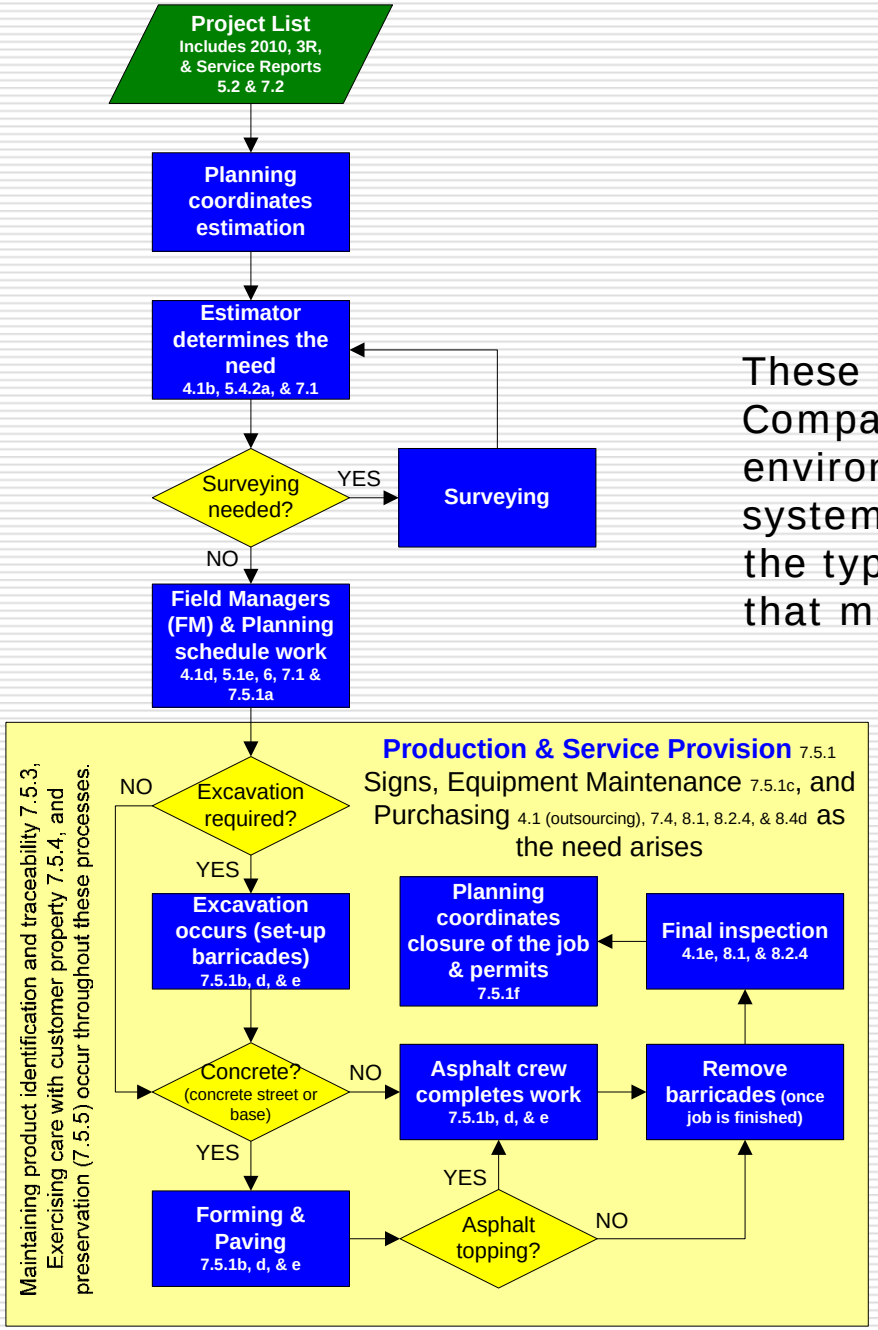
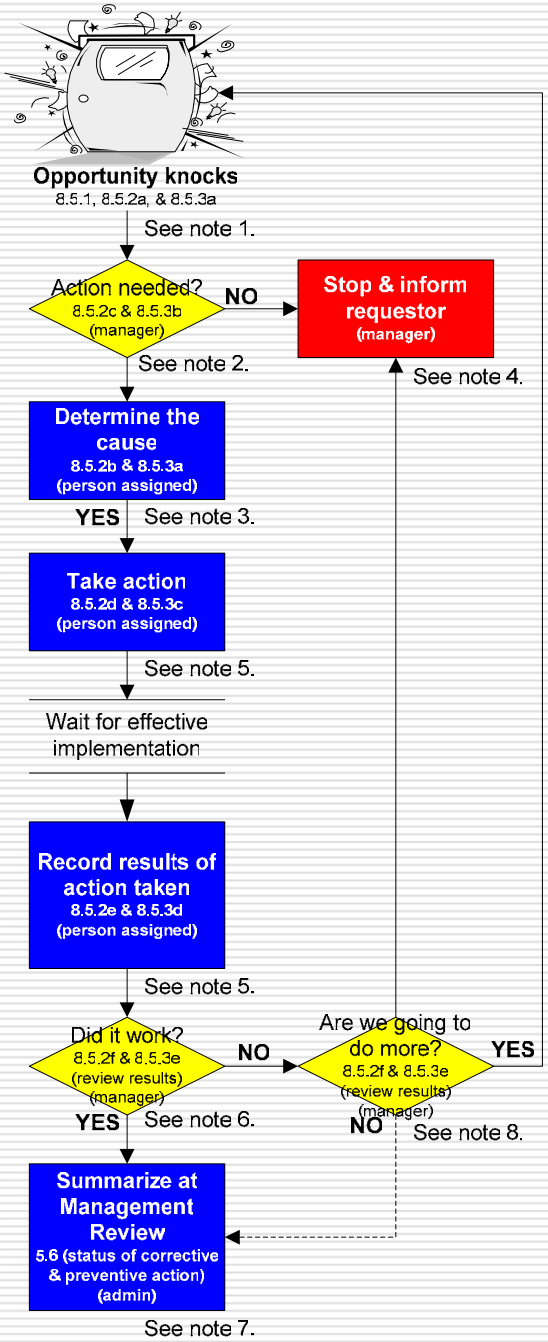
# Working With Area Personnel & Management, We Mapped Out A Process To Support More Effective Planning & Execution

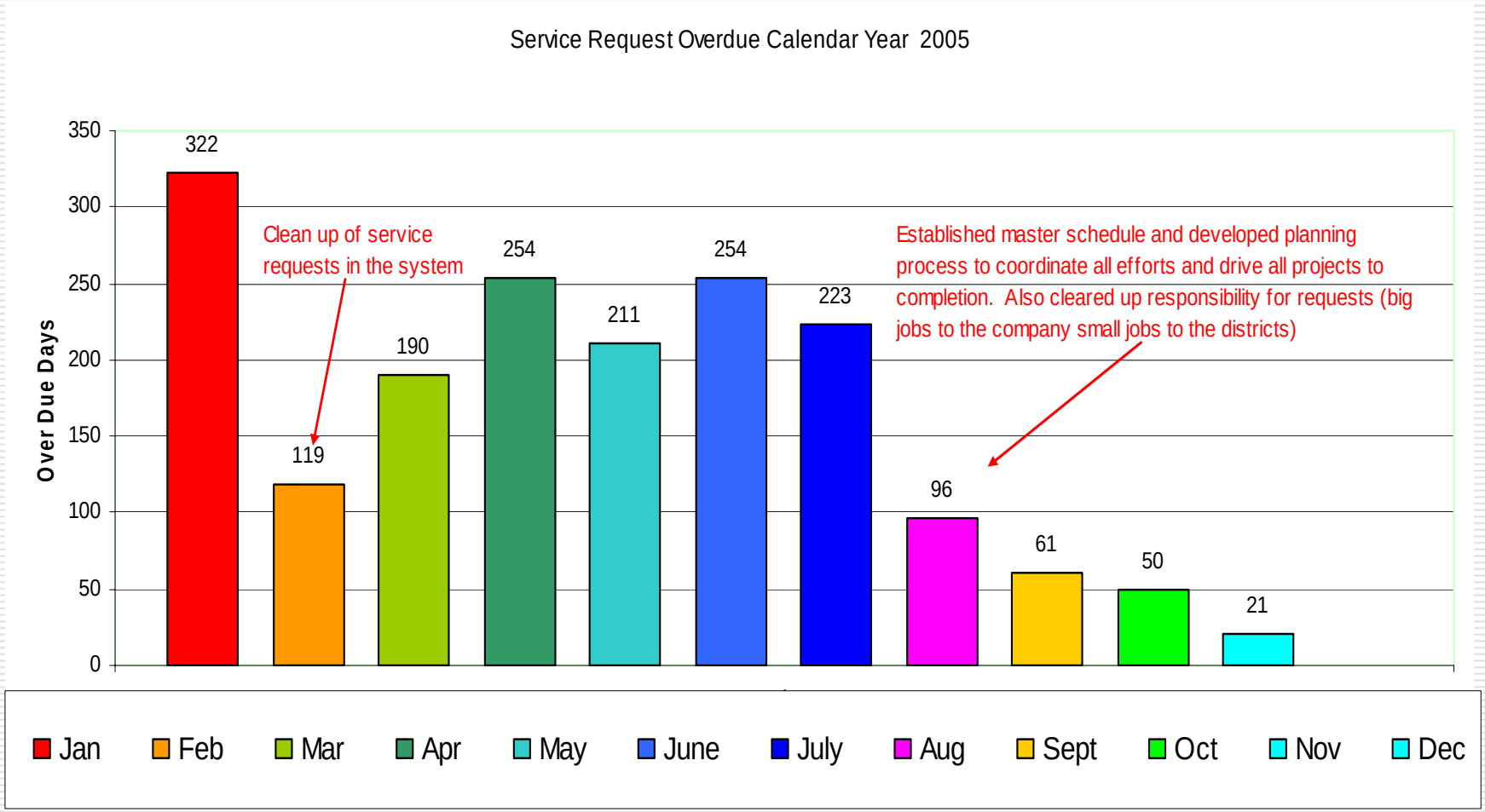



These processes will also helps The Company with establishing an environmental management system, as they give us an idea of the types of aspects and impacts that may be present!

We also utilized the platform that ISO 9001:2000 is intended to be to promote closed-loop processes that support performance-based management, bringing issues needing attention to the point of effective implementation.



# Example of Performance Measured We Are Using



# Example of Performance Measured We Are Using