

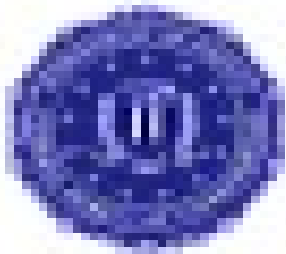
SCDOT PAVEMENT MANAGEMENT



Here we go again !!

SCDOT PAVEMENT MANAGEMENT

FBI



WARNING

Federal law provides severe civil and criminal penalties for the unauthorized production, distribution or exhibition of copyrighted motion pictures, video tapes or video discs.

Criminal copyright infringement is investigated by the FBI and may constitute a felony with a maximum penalty of up to five years in prison and/or a \$250,000 fine.

SCDOT PAVEMENT MANAGEMENT

THIS MOTION PICTURE HAS BEEN RATED



BY THE
CLASSIFICATION AND RATING ADMINISTRATION



www.filmratings.com

HOW WE GREW

by...

- **ADDING...**
- **31,000 MILES TO THE SCDOT PAVEMENT MANAGEMENT INVENTORY**



SCDOT Pavement Management 1994 - 1998



Data Collection
Responsibilities

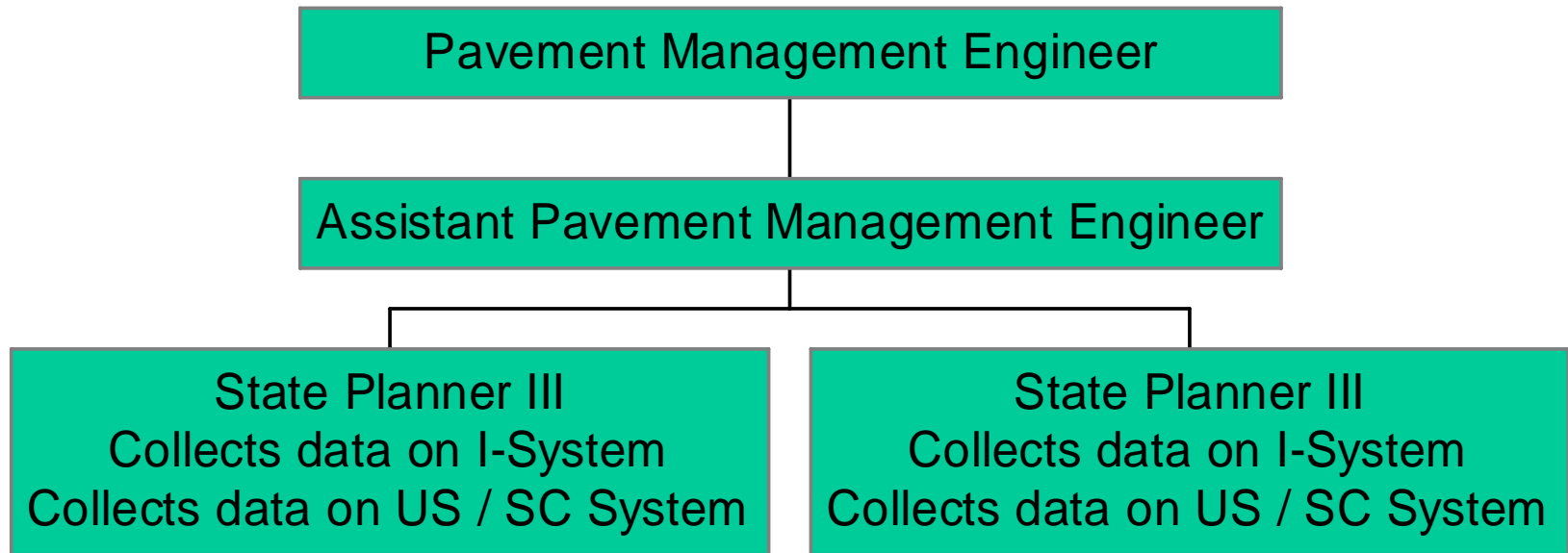
- **US / SC System** = 10k miles collected on a three year cycle
- **Interstate System** = 863 miles collected annually

Life was easy



Life was Simple

TABLE OF ORGANIZATION SCDOT PAVEMENT MANAGEMENT 1994 - 1998



The Mandate

The SCDOT Strategic Plan for 1998 set a new and ambitious goal for Pavement Management: **Start collecting data on the Secondary System by 2001.**



What the Mandate meant

- Pavement Management was being asked to:
- Collect / QC / Prioritize / Optimize / Report on almost **four times** what the office was already collecting



What Was Our Reaction? (end of the good times)

We need to
study this-----
Quickly!



Evaluating our existing resources

- We decided that with modification our HPMA Software was up to the job of analyze / prioritize and optimize.
- Our data collection method was in question...therefore we developed **Feasibility** and **Pilot Studies** in 1998 – 1999 to determine the type of data collection system to use.



1997-1998 Data Collection Feasibility Study

- **Study 1** S. D. Road Profiler w / 3 lasers
- **Study 2** Vehicle equipped with ICC MDR 2010 System (lower level of rut & roughness evaluation)
- **Study 3** Distress Evaluation Teams manually tabulate distress. (lowest level of evaluation)

Important Feasibility Study Recommendations

- Secondary PM be regional
- Collect via hand tabulation (can progress)
- Three regional offices
- Each office staffed by engineer and two raters

Feasibility Recommendations .. continued

Hand tabulation
was selected
primarily due
to the cost
factor



Pilot Study

Lee County became
our Bikini Island
(test grounds)
because: small /
ideal mix of urban
& rural roads that
could provide fast
answer.



Pilot Study...continued

- Develop a training course
- Develop a training manual
- Select two maintenance workers
- Training = 1 week
- They collected all of Lee County
- Met with us weekly
- S.D. profiler rates Lee County



What the Pilot Study Taught Us

The Pilot Study was quite valuable. It showed us that there were really only **two important ideas** we needed to follow to successfully expand our Pavement Management operation:

- I. **First Idea: Reconsider collecting... go High Tech ... same way as the Primary System.**
Hand tabulation was labor intensive / time consuming / very subjective.
- II. **Second Idea: Given the first idea, understand that the Secondary System presents new challenges that require new solutions.**

How Did the Pilot Lead Us to the Two Ideas?

- The pilot project gave us a format for experimenting.
- We chose to try a technically unsophisticated, least-cost approach----and clearly saw this would not work.
- By the end of the pilot we knew:
 - We needed to automate – S.D. Road Profiler
 - All route collection data should be held to the same standards.
 - The mere size of the Secondary System (31,000miles) meant that a completely digitized format was the only way to collect / process / store / analyze / report accurately.
 - We needed enhancements to the existing software

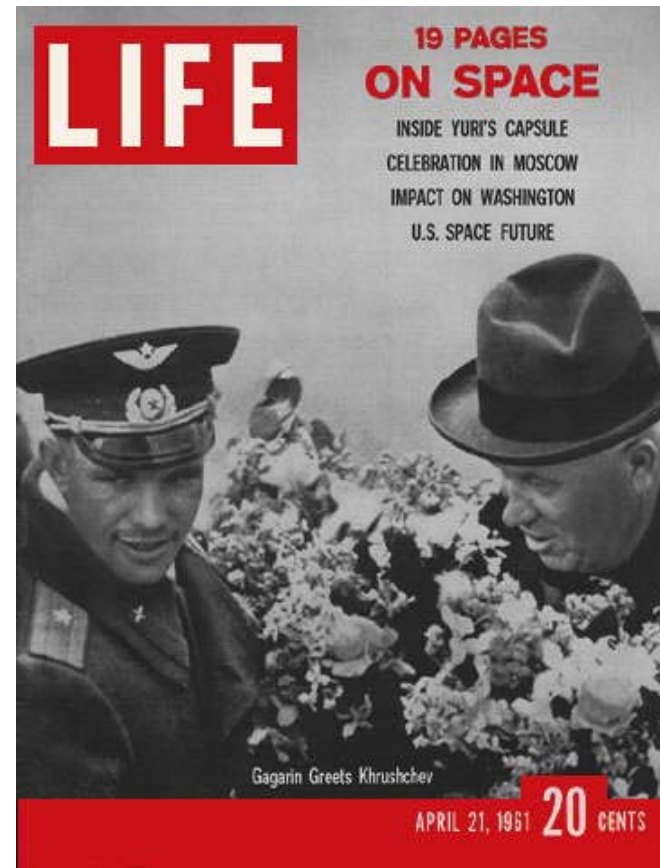
ENHANCED MANDATES !!

- Upper Management now wants: (*they thought we had an easy button*)
- **Digital images on the Secondary System**
- **GPS on the Secondary System**



Some of the New Challenges...

- **Size:** Over 31,000 additional miles. This is MASSIVE !!
- **Fragmentation:** Large number of short routes. In urban areas the system consisted of a vast network of short routes. Our software was not designed to analyze.
- **Data collection time:** Route characteristics and the number of routes would increase collection time per unit mile. We reduced acceptable collection rate.
- **Data storage:** Videos and MDR.
- **Data processing:** Enhancements
- **Quality Control:** Enhancements due to size. Must change and speed up QC.
- **Collection Schedule:** What is realistic? Weigh marks



Some New Solutions: Phase I

- **Business Rules...**for data collection / processing / filtering of bad data.
- **Logistics:** Set up 3 regions.
- **Quality Control:** Strict protocol. Data review process must be automated.
- **Rate of Collection:** 20 miles per day (Pilot adjusted downward for the urban and the unknown).
- **Downtime factor:** Assume 30%--- about 6 days per month (US/SCs adjusted downward for the unknown).



Some New Solutions: Phase

II

Beaver

Wally

- We bought: 3 vans with laser sensors and cameras.
- We set up an office for each of the three regions: Low Country (Charleston), Midlands (Columbia), and Piedmont (Greenwood).
- We worked with IT Services to install the set-ups, links, and high-speed lines.
- ...*and*...



Looking for a job ??

- **AND....We hired a lot of folks.**
- We hired four engineers
- We hired six state planners



WE HAVE THE MOST JOBS.

[Click here to search over a million jobs](#)

careerbuilder.com

The advertisement features a monkey in a light blue dress shirt, a striped tie, and dark suspenders, looking upwards with its mouth open. The background is white with a blue button and the CareerBuilder logo.

We went from: (*four guys & a truck*)...to

TABLE OF ORGANIZATION
SCDOT PAVEMENT MANAGEMENT
1994 - 1998

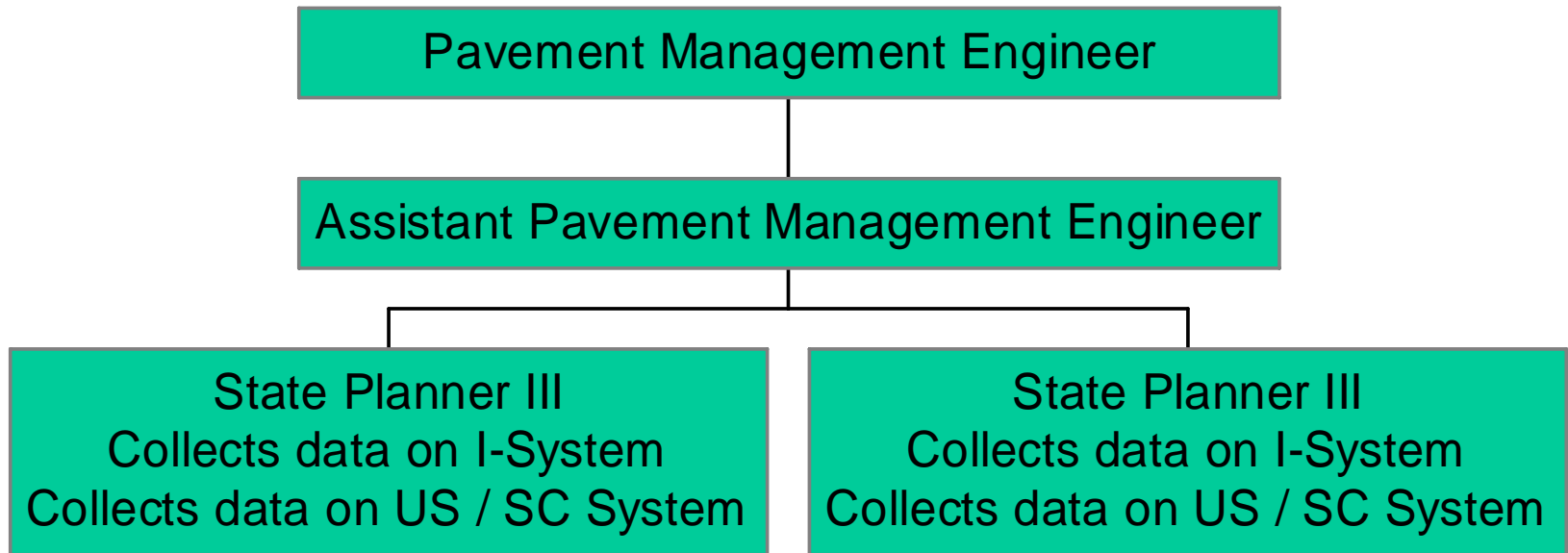
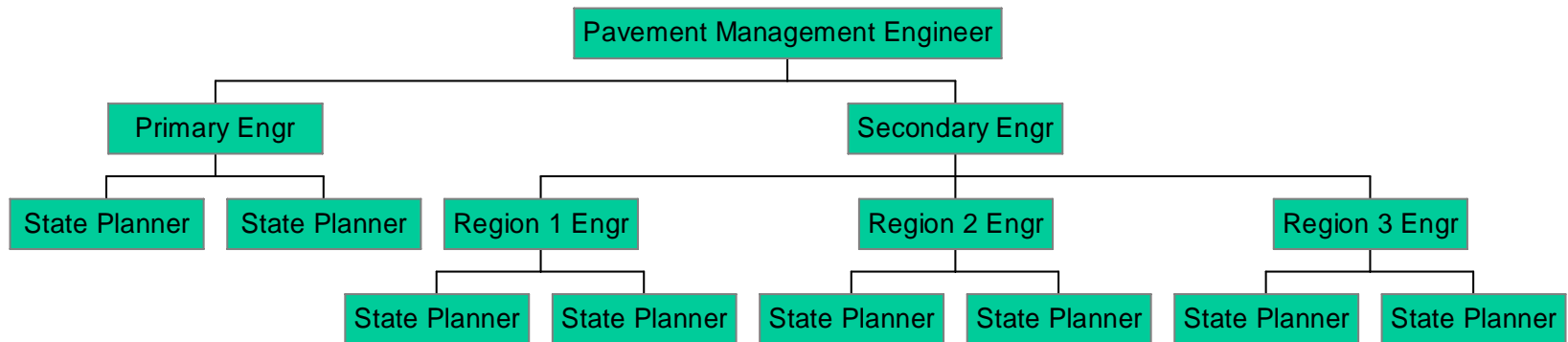


Table of organization SCDOT Pavement Management 1998 - 2006

Pavement Management Table of Organization
1998 - 2006

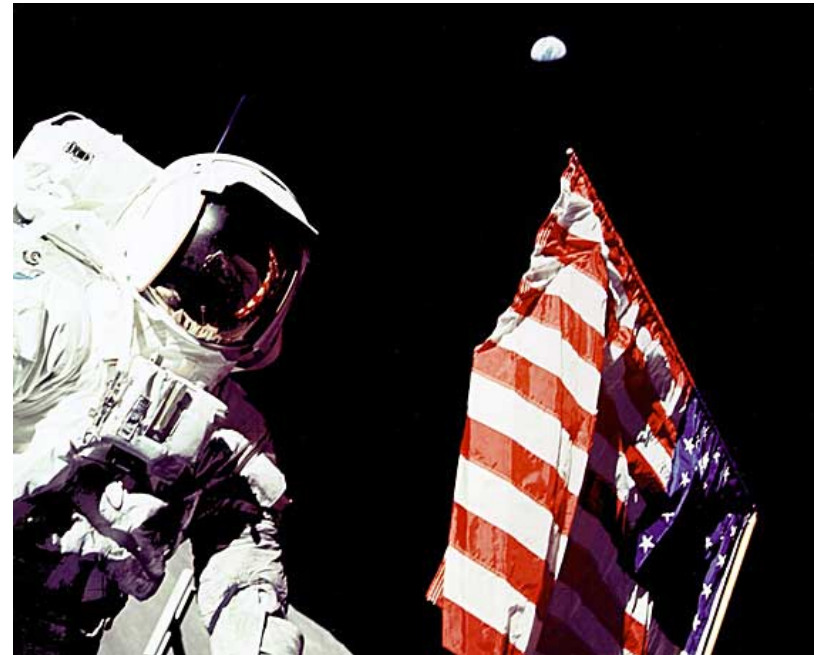


Some New Solutions: Phase III

Keep Solving!

Pavement

Management---
especially with
the Secondary
System----is a
work in progress.



Execution

- **The Five Essentials of Success:**

- Training
- Process
- Tracking
- Quality Control
- Timetable



Training for Engineers and Raters

Part 1

- Intense Training period:
2.5 weeks...after which 3
months on the job
training.
- Study Distress
Identification / extent /
severity)
- Study MDR Profiler
System / digital image
System and GPS System)
- Study Trouble
Shooting...working with
booby trapped profilers)



Training for Engineers and Raters (2.5 weeks) Part 1...daily activities

- Hands on training
- Review / Critique
- More hands on training
- Review / Critique
- Finals / certification
- Additional monitoring of raters



Training for Engineers Part 2

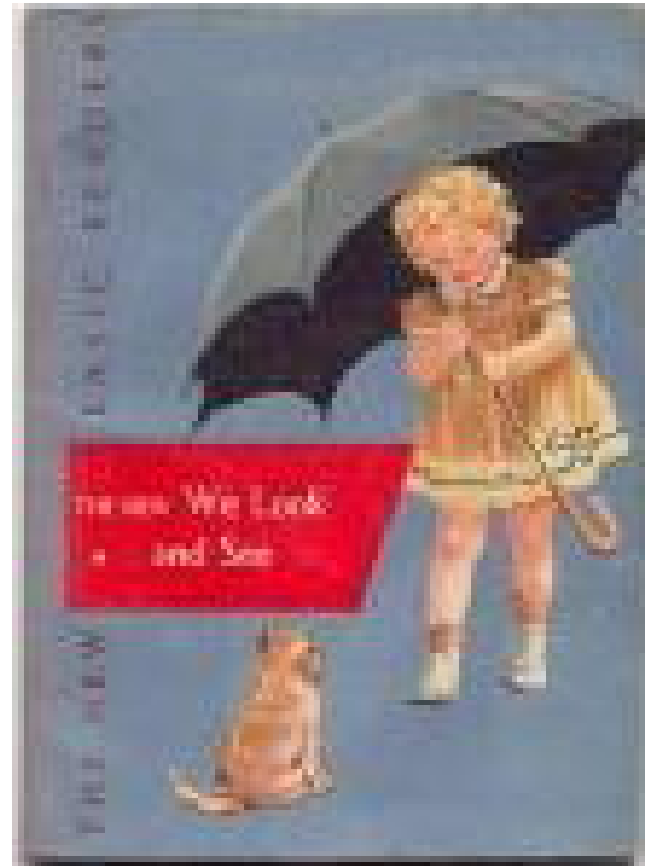
HPMA ops

- Training period: 1.5 weeks
- Basic HPMA functions
- Hands on practice
- Review / Critique
- Intermediate HPMA functions
- Hands on practice
- Review / Critique
- Testing / certification



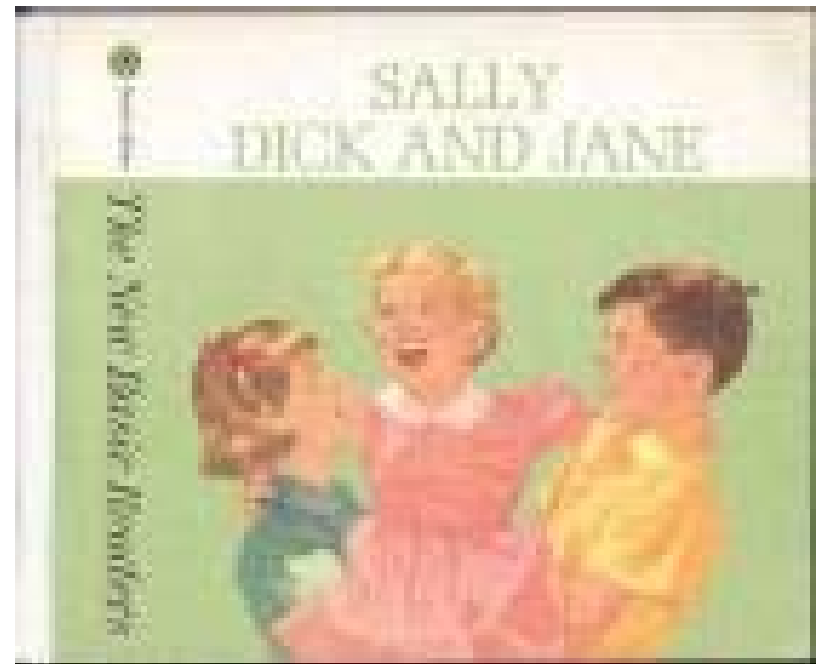
Training..continued

- All Training Courses developed by the SCDOT Pavement Management Office
- All Training Manuals developed by the SCDOT Pavement Management Office



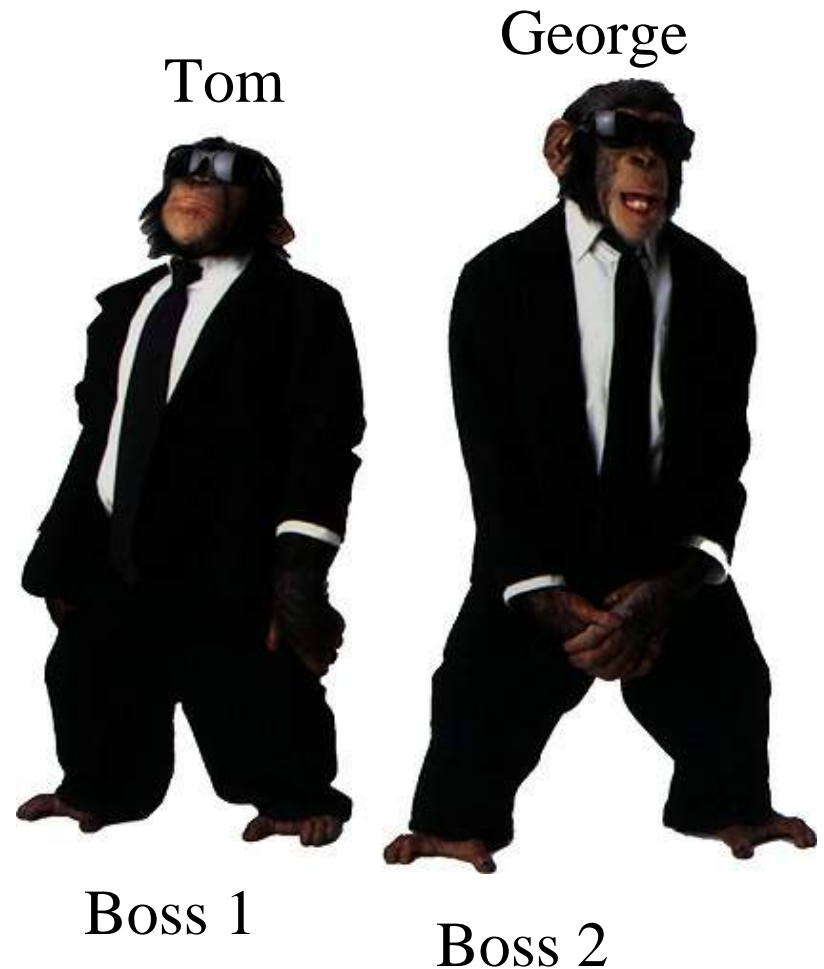
Training...con't

- **Training Manuals included**
- Introduction to Secondary Pavement Management Procedures
- Secondary Pavement Management Training Manual
- HPMA Training Manual Vol 1.1



Training...hindsight

- We knew that time allotted for training was insufficient....
- Obviously there was a great deal of :
- Trial by fire
- On the job training
- But...We were successful !!



Process

- Organizing for storage
 - MDR – hard drives / portable hard drive = space
 - Images – big space eaters / must be kept with MDR at all times.
- Organizing for processing and loading
 - MDR – network drive storage via year / region / week / county
 - Images – as above



TRACKING

- Comprehensive matrix that was designed for maximum accountability. This tracking sheet provides the status of every secondary route in the state.



TRACKING

- Inclusive of image collection / data collection / process / loading of distresses / images / hand data collection on very small routes / will this route be re-visited next cycle.



Quality Control

- Data quality: Size again placed new demands.
- QC control points and develop new protocols
 - Raters
 - Regional Engineers
 - Pavement Management Engineers
 - Rater Performance Reviews



QUALITY CONTROL...CON'T

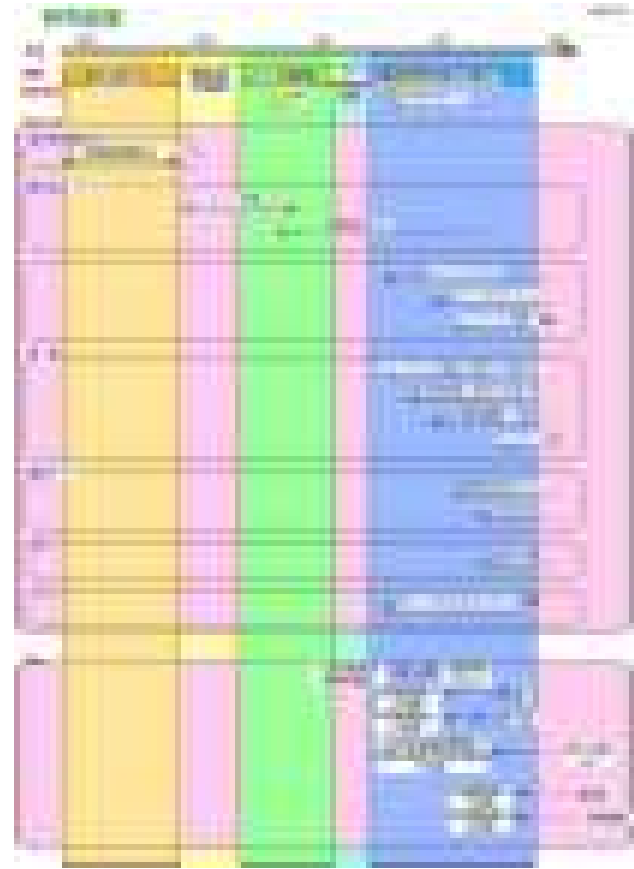


- Develop with Stan-Tec the ability to perform QC in mass via new software that compares new data with historic distress.

Timetable

The System will require 3 years : huge unknown

- Based on daily rate for USSCs adjusted downward
- Based on margin for downtime
- Based on margin for unknown factor----all still new tasks
- Based on margin for other unexpected developments from other directions



What we learned

- **Always expect the unexpected** (DESRALI)
- The unexpected ..
Suddenly,
Management imposed
a drastically shortened
timetable for data
collection and
reporting on 46
counties



What we Learned

- Original schedule allowed for a three year data collection and reporting season .
- Management's new and improved schedule called for a shortened 2 year data collection 6 months reporting season.
- We fulfilled 92% of mandate while **minimizing adverse impact on QC and rater moral** by focusing on rural routes collecting 100% and collecting urban as time allowed
- In the end we collected 100% in 32 counties / 72-95% in remaining 14 counties.



What We Learned...con't

- Pavement Management is a work in progress.
- Quality **MUST** be job one.
- Management needs us.



Where we are ?...and where we might go ?...

Where we are !!!

- **Strong identity:** We are well known through out the Department as a successful management system. We have produced quality data since 1994. We have been asked to take on much more responsibilities since our original Mission Statement.
- **Continuous learning:** We know that we are not the finished product.
- **Resource for management...and they are learning that.** We are almost appreciated



Where we are...and where we might go...con't

Where we are!!!

- **Highly skilled unit:** We promote from within. We take our time when shopping for new personnel, performing a lot of upfront homework in the hiring process to ensure that the new personnel are a good fit...the tail does not wag the dog. It takes about 1.5 years for a rater to come up to snuff. Results?? Excellent staff with a very low rate of attrition.



Where we are...and where we might go...con't

- **Where we are**

Outstanding QC

program...this is the genre of our whole system. We are information brokers. Our reputation is the quality of our data

Forward thinking looking for new ways to solve problems

We are becoming a more important resource for management



Where we are ?...Where we might go ?...con't

- Management is now asking us what it will take to collect and report on the Secondary System on a two year cycle.



**I say...I say
QUESTIONS....?????**

