Best First

A Strategy for Extending the Service Life of Roadways

(or are you a chicken?)

Premise for this presentation

You don’t have enough scratch to do it all

(or do you…more on this later)

What is Best First?

- A maintenance strategy that people use everyday for decision making when funds are limited
  - **You own two hen houses and want to keep them. One good, one bad. Both need a new roof. You can only afford one roof. Which house should you choose?**

What is Best First?

- A maintenance strategy that recognizes that sometimes you just have to let some things go…
  - **You didn't put the roof on the bad house**

Or do you really have to let some things go?

But more on this later!

What is Best First?

- A maintenance strategy that protects your most valuable assets.
  - **The structure and contents of your good house are maintained**

What is Best First?

- A maintenance strategy that recognizes if you try to save everything… you could lose everything (and this not good)
  - **The structure and contents of your good house are maintained**
    - instead of eventually having two bad houses… but one with a damn good roof

What is Best First?

The house example may seem like too simple of an illustration to relate to roads. But do other maintenance strategies really cause you to lose everything? Or at least lose too much?

What is Best First?

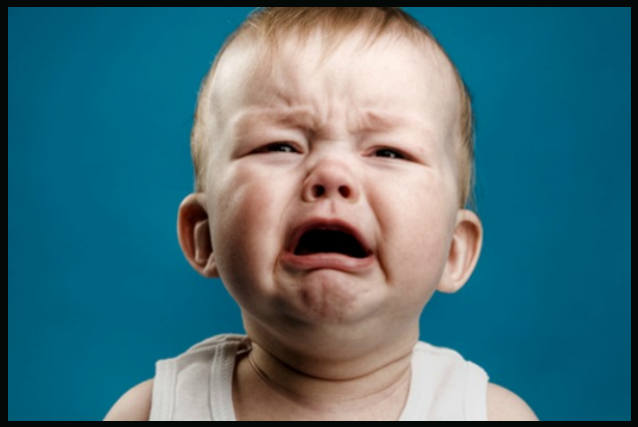
- A maintenance strategy that recognizes that by trying to save everything… you could lose everything
  - **85% of Michigan's county road agencies have more than 30% of their Primary Network in poor condition**
  - **47% have more than 50% poor primary roads**
  - **11% have more than 70% poor primary roads**

Do Other Strategies Work Well?

To have this much of the primary network (the most important 30% of a county system) in poor condition clearly shows the results of trying to save too many miles for way too long.

But it’s my job to save them all!

Waaah, waaah , waaah…..cry me a river



But more on this later too!

Enough for vague references

- The Barry County Road Commission
  - **sealcoats all HMA surfaces, including fed aid projects, reconstructions and overlays (no matter the thickness) the same year it is laid.**
  - **has been doing this for over twenty years**
  - **has an excellent paved road system both primary and local roads. We believe the best in Michigan!**

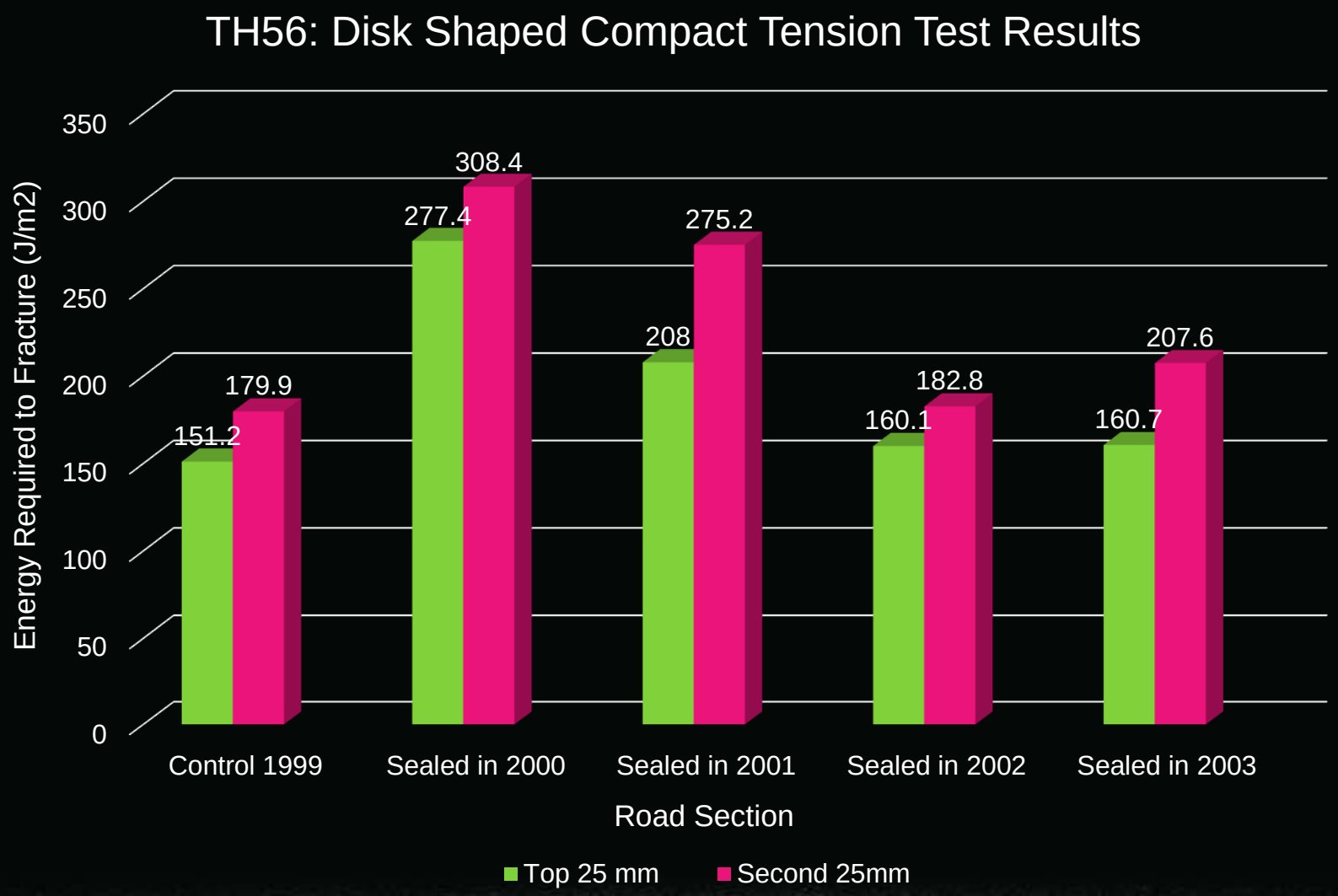
The Science

- Flexibility & Elasticity (the lifeblood of an asphalt pavement)
  - **Flexibility is the ability to bend without breaking**
  - **Elasticity is the ability to return to original form**
  - **Without enough your pavement will fail**
- Oxidation (Hardening)
  - **Caused by exposure to the sun and air**
  - **Results in loss of flexibility and elasticity**
  - **Eventually leads to brittle, failed pavements by penetrating downward through the asphalt matrix**
- Chip seals within one year (of initial asphalt laying)
  - **Exposes aggregates (chips) directly to the sun and air**
  - **Severely slows the oxidation of the underlying asphalt**
  - **Preserve the flexibility & elasticity of a very expensive investment**

The Data

- Minnesota DOT did a fifteen year study on a newly paved section of state highway.
  - **In 1999 - 5 miles of state highway were paved.**
  - **A control section mile was left without any preventative maintenance**
  - **Each year, 2000 through 2003, one of the remaining miles was chip sealed**
  - **Cores were taken in year fifteen for each segment of road**
  - **Fracture tests results are shown on the following chart**

The Data


TH56: Disk Shaped Compact Tension Test Results
Energy Required to Fracture (J/m2)
350
300
250
200
150
100
50
0
151.2
179.9
277.4
308.4
208
275.2
160.1
182.8
160.7
207.6
Control 1999
Sealed in 2000
Sealed in 2001
Sealed in 2002
Sealed in 2003
Road Section
Top 25 mm
Second 25mm

The Data

- The Barry CRC has numerous segments of primary and local roads that were overlaid 20+ years ago and are still Paser 7 or 8.
- At least one heavily used primary that is 34 years old and still an 8.
- Two federal aid projects that extended into villages in which the village didn’t seal show much worse pavement conditions.

We would be happy to take anyone on a tour with our road segment repair histories in hand to give you visual representation of our system

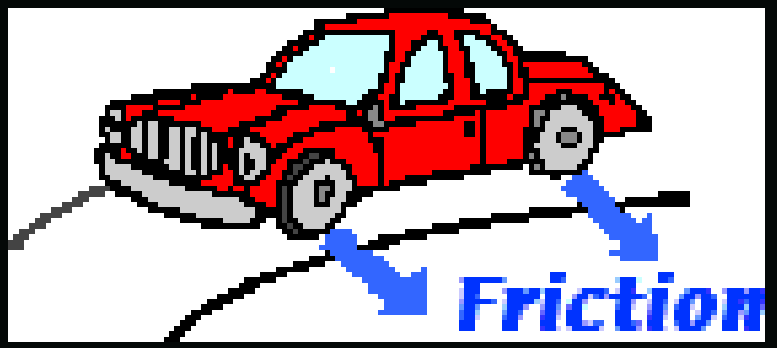
The Data

- Decreased Maintenance
  - **NO (negligible) patching costs on roads over 20 years old…patching almost eliminated**
    - We do patch, but not much, and it's almost all on our roads we haven't got to with this procedure yet

The Data

- Safety Improvement
  - **Particularly in wet, snowy and icy conditions**
    - Pine Lake Road primary curved section of road with numerous runoffs while HMA surfaced. Runoffs almost eliminated with chip seal.

Donated by Action Traffic Maintenance



The Proof

- Barry CRC paved road conditions
  - **Average Paser Rating county wide of 6.92**
    - Primary roads at 7.4
    - Local roads at 6.24
  - **Federal Aid Eligible roads only 6.5% poor**

The Pitfalls

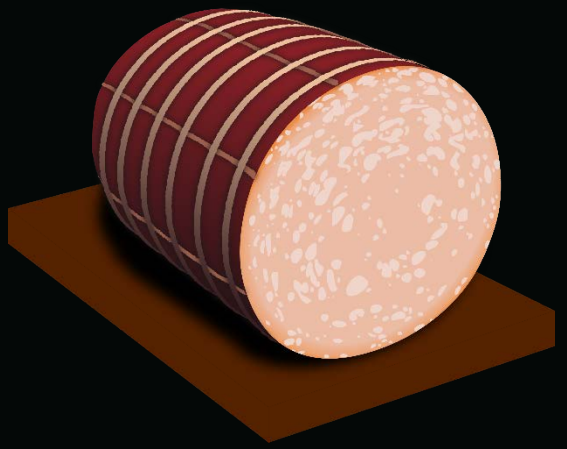
- Higher initial cost
- Further initial neglect of other roads
- The big hurdle…Public Complaining
  - **Still present but not bad** **(but it was initially brutal)**

So… are you a chicken?

More on that Later

- You don’t have enough scratch to do it all
- Sometimes you just got to let some things go
- But it’s my job to save them all

All a bunch of bull___!



More on that Later

- With only 6.5% poor. Have we proved:
  - **You do have enough money to save more of your system than with other strategies**
  - **You don't have to let much go, at least not a significant part of your primary system that seems to the norm around the state**
  - **It is indeed your job to save as many as possible and more can be saved with a best first maintenance philosophy**

The End Results

- An agency that can properly maintain a high percentage of roadways in good and fair condition freeing up funds to go further elsewhere
- A great system, one with which employees can be proud to be associated! Our productivity has increased steadily along with our system quality.
- A public with overwhelming support for the Barry CRC! In spite of a tough few years educating the public.
  - **Ed Sarpolus of Target Insyght did a study for the Barry CRC before this last funding increase researching a county road millage. 80% of residents believed the Barry CRC was doing at least a fair or good job with their current funds.**

The Takeaway (if you remember only one thing)

BEST FIRST is first best, superior to worst first & best last, but not necessarily synonymous with worst last. Best first frees up funds through decreased maintenance, decreasing time to get to the worst. Making the worst, last but not least and essentially almost first.

Thank you!