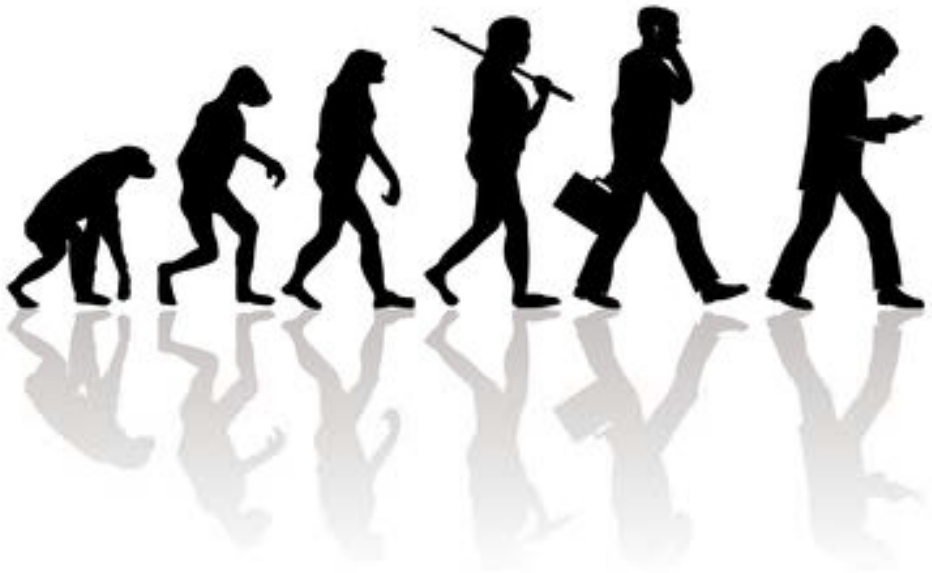
INTEGRATING PAVEMENT MANAGEMENT AND GIS

A case study of Pavement Management in Chelan County

Our Road to Full Adoption of a PMS

- The evolution of PMS at Chelan County
- Our current process
- Use of GIS to reduce mobilization costs
- Lessons learned

The evolution of Pavement Management at Chelan County



Chip Seal Everything

Entire regions were chip sealed – with some exceptions

Pros - Costs per mile of preserved road were low
Mobilization costs were low
Over time it could lead to a regional cycle

Cons – Preserving some roads unnecessarily or too early
No method to the madness

Begging for Dollars

Maintenance Foreman make a case for preservation funds

Pros – The Foreman who get the most money are happy

Cons – Worst first tendency

Costs per mile of preservation were high

Miles of roads preserved low

No method to the madness

Reviewing Pavement Management Results

Running the PMS and sharing the results with Maintenance Foreman and Director

Pros - Beginning to use data to drive decisions

Reduces the human element and favoritism

Cons - Bad data led to bad PMS results

Didn't get buy-in because of bad PMS results

Data Improvement

Updating pavement histories and improving pavement condition data

- Previous road project information was improved
- Previous preservation history was improved
- Original road construction information was improved
- Consistency in pavement ratings was improved

Reviewing Pavement Management Results

Running the PMS and sharing the results with Maintenance Foreman and Director

Pros - Reduces the human element and favoritism

Improved data led to improved results

Foreman and Director begin to see the benefits

Cons - Mobilization costs were not accounted for

GIS Integration

GIS was used as an analysis tool to reduce mobilization costs

Pros - Mobilization costs were reduced

Cons - Introduces the human factor

Full Adoption of Pavement Management

- Changes in upper level management
- Better data let to better PMS results
- Mobilization costs have been reduced
- The PMS process is repeatable, predictable, and consistent

The Process

- Run the PMS
- Export the PMS results into Excel
- Import the PMS results into GIS
- Perform GIS analysis
- Review the roads selected for preservation

Run the Pavement Management System

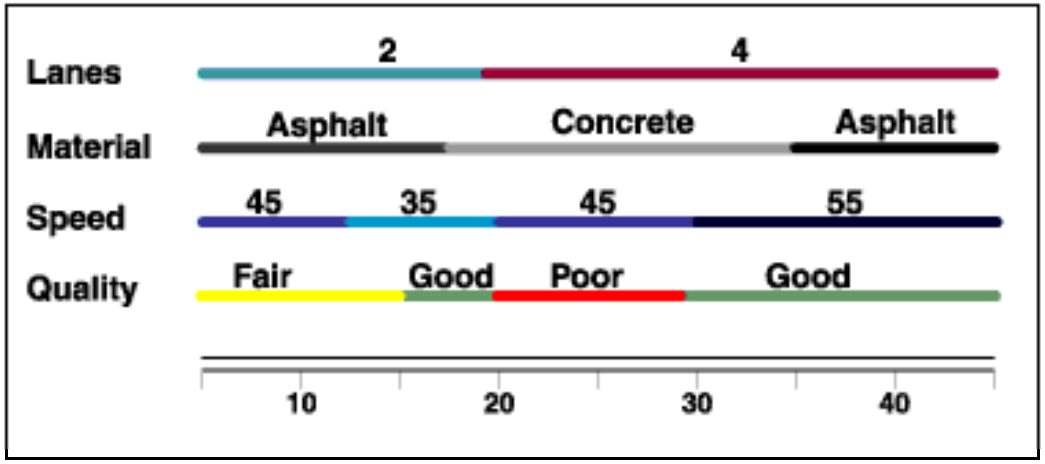
- We use the PMS module in Mobility (provided by CRAB to all WA counties)
- We typically run the PMS for 5 years worth of projects
- The estimated costs for each maintenance district are totaled and that becomes the budget for each district

Exporting the PMS Results

- Make sure you have any and all pertinent data fields to perform analysis
- BMP & EMP
- A unique field that links the PMS data to the GIS data (five digit road number)
- We also include data fields for ADT, Pavement Condition, Truck Routes, Functional Class, Year Paved, etc.
- Make sure the Excel formatting is compatible with GIS

GIS – Linear Referencing

- Linear Referencing is the method of displaying geographic locations along a measured linear feature (Can be points along a road or a linear segment of a road)



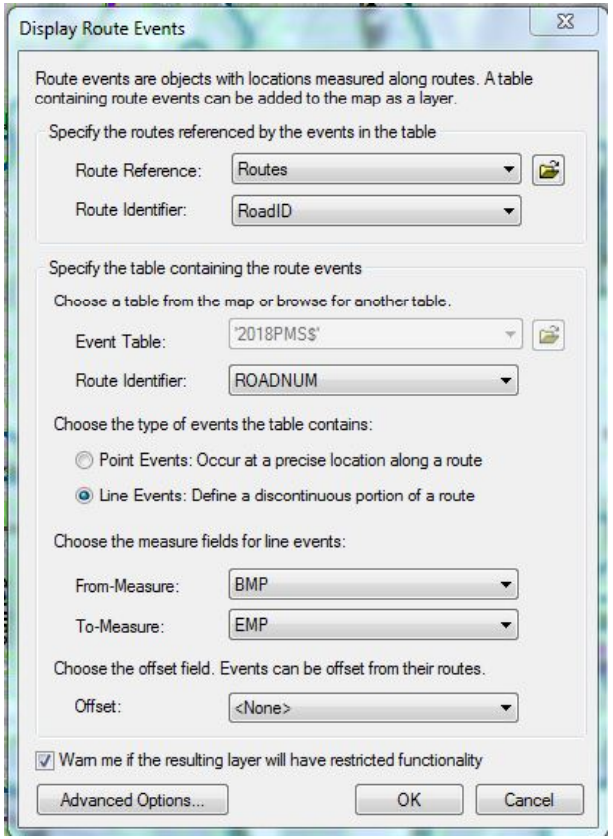
GIS – Routes Data Layer

A route is a linear feature that stores a unique identifier and contains measured distance along a line

- Routes are created from a street centerline data layer by entering the starting point (BMP), ending point (EMP), and unique identifier (five digit road number)
- Once a Routes Data Layer has been created, any tabular data with mileposting and road number can be displayed in GIS

Importing PMS Results

- Link the unique road number in GIS to the same road number in the Excel PMS data
- Select Line Data
- Choose BMP & EMP fields in Excel PMS Data



GIS Analysis

- Analysis is performed manually at this point in time
- PMS results are symbolized by planned preservation year
- Groupings of roads within the preservation window are identified
- Outliers are exchanged for other roads in closer proximity
- Roads are added and removed within each district until logical groupings of roads are found

Road Reviews

- We drive the roads proposed for preservation to verify the results
- One Road Review for each maintenance district
- Maintenance Foreman, Maintenance Supervisor, Assistant Director, Pavement Manager
- Roads and preservation types are changed as needed
- Input from Maintenance Foreman helps with buy-in

Lessons Learned

- Bad data = bad PMS results
- Lack of funding for Preservation Program
- Reduced mobilization costs
- Increased buy-in from maintenance staff
- Cost-Benefit?

Questions?