Transforming Your Pavement Ratings Into an Asset Management Plan Tool
First Group Engineering, Inc.

Our Tool bag includes:
- GIS Field Inventory
- Asset Management Planning
- Highway/Street Maintenance Design
- Right-of-Way Analysis/GIS Exhibit Prep
- Construction Management/Observation

Professional Support:
- Performing Field Inventory FAST
- Creating Asset Management Plans
- Assistance in Obtaining Financing
- Assistance in Creating Bid Documents
- Bidding, Contract Writing, and Awarding
- Construction Observation & Record Keeping

Office Locations
**Shawn Strange, PE**

First Group  
INDOT/ LPA Road Designer since 1996-Now  
Damage Assessment Engineer FEMA – 2005  
Asset Management Plan (AMP) Engineer – 2007-Current:

- Town of Avon  
- City of Monticello  
- City of Greenwood  
- City of Vincennes  
- Knox County  
- Greene County  
- City of Sullivan  
- City of Lawrence  
- City of Nappanee  
- City of Covington  
- City of Merrillville  
- City of Franklin  
- City of Seymour  
- Huntington County  
- City of Rensselaer  
- City of Rockport  
- City of Hammond  
- Town of Flora  
- Decatur County  
- Town of Haubstadt  
- Town of Hartsville  
- City of Linton  
- Franklin County  
- City of Greensburg  
- Town of Brownsburg  
- Town of St. John  
- City of Mishawaka  
- Town of Paoli  
- City of East Chicago  

2018 Purdue Road School  
Wednesday March 7th, 2018
Quick Comment on Recent Weather and Road Conditions

“The nonstop flow of customers with chuckhole-riddled wheels is easily the worst in at least 45 years,” said Randy Peterman, who owns Peterman's Tire Center at 2633 Shelby St.
Quick Comment on Recent Weather and Road Conditions
How to Use PASER to Create Asset Management Tools?

Requires a **Turnkey** approach of understanding why the pavements are rated the way they are to creating a plan.

This requires:
- Creating a record keeping system for rating your road network
- Understanding Asset Management Plan Creation
- Securing funding for the long term and creating community support
- Bidding the work in the plan in phases
- Overseeing the work and specifications
- Tracking results over time

Lets start with how we use PASER....
| Rating 10 | No maintenance required |
| Rating 9  | Little or no maintenance |
| Rating 8-7| Routine maintenance, crack sealing, fog sealing |
| Rating 6  | Preservative treatments (sealcoating and thin overlays) |
| Rating 5  | Mill and overlay |
| Rating 3 & 4 | Structural improvement and leveling (Patching with Overlay) |
| Rating 1 & 2 | Reconstruction, FDR, Recycle/Overlay, or Patching with Multiple Layers |

What is PASER?

[Graph showing the relationship between pavement condition and age]
Plan for What Your Rating Will Mean

Set a cutoff between:

• Preventative Maintenance (Rejuvenator, Chip Seal, Microsurface, Crack Seal)
• Functional Maintenance (Patch, Mill and/or Overlay) and
• Structural Maintenance (Pavement Replacement)

End Goal is to set up three programs with three budgets. This keeps your new pavement new and brings your bad pavement up to good standards.
## How to Use PASER

<table>
<thead>
<tr>
<th>10, 9, 8</th>
<th>7, 6, 5</th>
<th>4, 3, 2, 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New - Very Good</strong>&lt;br&gt;Little or No Maintenance</td>
<td><strong>Good - Fair</strong>&lt;br&gt;Capital Preventative Maintenance</td>
<td><strong>Poor - Failed</strong>&lt;br&gt;Heavy Rehabilitation or Reconstruction</td>
</tr>
<tr>
<td>Estimated Costs&lt;br&gt;$0 - $3,000 per mile</td>
<td>Estimated Costs&lt;br&gt;$5,000 - $100,000 per mile</td>
<td>Estimated Costs&lt;br&gt;$130,000 - $500,000 per mile</td>
</tr>
</tbody>
</table>

Use these costs as well as bid histories to create your budget forecast.
How to Use PASER

Pavement Deterioration and Maintenance

For every $4,000 to $8,000 you spend on routine and preventive maintenance in the GOOD zone . . .

You’ll have to spend $20,000 to $80,000 on preventive maintenance and rehabilitation in the FAIR zone . . .

Or $200,000 or more on rehabilitation or reconstruction in the POOR zone.

Use the Right Treatment on the Right Road at the Right Time
How to Use PASER

Watch for Alligator Cracking in the Wheel Path – Must Patch or Thicken Pavement Section

Raveling begins Immediately and can be seen as black marbles in the gutter lines – Use Fog Seal

L/T Cracking is a Top-Down Crack that can be crack sealed to prevent future problems – Use Crack Seal
What Have You Learned from PASER Training?

- Stick to cutoff points.
- Avoid Political Traps of Paving 7’s for Aesthetics
- Don’t be too pessimistic - Not many roads under a 3 in Indiana (EXCEPT AFTER THIS WINTER)

How to Deal with Good Pavement that is Rated 4 ->

- New Pavement Failing with Alligator Cracking in the Wheel Path
- Either Pavement is too Thin or Commercial and Industrial Vehicles were not accounted for in the pavement design.
- The reason this gets a 4 is that it needs extra thickness immediately before failure.
  - Scarify and Overlay only easy solution
How to Use PASER

Surface Layer Delamination
• Mill and overlay can fix

Pot hole is into Subbase Layer
• Patching is required before Mill and Overlay

Sometimes a Pothole is *Not* a Pothole
Important to Catch!!!

- Must stop the concrete from rocking before overlaying.
- INDOT – Underseal and Stitching

Reflective Cracking – Underseal, Wedge & Level, Glassgrid or Paving Fabric, Overlay
How to Use PASER

PASER 1 – Full Depth Reclamation (60% Cost of Reconstruction)
AMP Process

Road Inspection and Road Inventory

Database

Traffic Data

Prioritization of Maintenance Intervention

Condition Rating

Rating Scale

Maintenance Budget

Annual Maintenance Program
Pavement Asset Management Involves:

Field Ratings (PASER Rating) = Supporting Inventory Documentation + Types and Severity of Defects

Best Tool For This Is GIS
Where Do You Start to Create Your Graphical Database?
AMP Process

Modify base data

- Copy road layer
- Trim/delete roadways to jurisdiction boundaries
- Identify excluded roads (INDOT, private)
- Label street names
- Use colors other than red, yellow, green
- Set up layout view
## AMP Process

Use New Database for Field Collection and Map Creation for Exhibit Creation
AMP Process

Collect Data:

- Insert desired fields: measurements, distresses, PASER
- Use proper field type: text, number, length
- Use shapefile-friendly names
- Use pick lists
- Assign color range to PASER field: 1=Red, 10=Green
AMP Process

FIELD DATA COLLECTION
AMP Process

**ADDING DATA**

- **Select Each Roadway Centerline Segment and Add Attributes**
  - PASER #
  - Defects – Cracks (Types), Rutting, Severity
  - Pavement Width
  - Anecdotal Traffic Volume (L,M,H) – Helps in assigning priority
  - Date
  - Other Observations (Standing Water, Drop-Off, Angry Resident….)

**AMP Process**
Typical ARCMAP PASER Color Setup
EDITING DATA FOR THE AMP

- **DBF** is a readable format for Excel
  - Just Import
# AMP Process

## Use sorting features in Excel (Protect ObjectID!)

<table>
<thead>
<tr>
<th>PASER</th>
<th>Road Class</th>
<th>Traffic Volume</th>
<th>School</th>
<th>Police</th>
<th>Fire</th>
<th>Snow Route</th>
<th>Thoroughfare Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Excel screenshot showing sorting feature](image.png)

**Note:** Add the ObjectID! column to protect object information.
### AMP Process

- **Calculate Segment Areas and Add Maintenance Activities and their Unit Costs**

Use referencing formulas to create the format you need.
### AMP Process

Take Your Spreadsheet to the Next Level
Color Coded Cover Sheet Summation for AMP

#### City of Rensselaer 2016-2020 Pavement Management Plan

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Crack Seal</td>
<td>$43,221</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ 71,768</td>
<td>$ -</td>
<td>$ -</td>
<td>$114,989</td>
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<tr>
<td>HMA Seal</td>
<td>$ -</td>
<td>$23,596</td>
<td>$55,320</td>
<td>$85,532</td>
<td>$78,011</td>
<td>$ -</td>
<td>$ -</td>
<td>$242,459</td>
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<tr>
<td>Microsurfacer</td>
<td>$39,463</td>
<td>$70,171</td>
<td>$97,844</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$207,478</td>
</tr>
<tr>
<td>Mill &amp; Overlay</td>
<td>$313,515</td>
<td>$419,468</td>
<td>$269,396</td>
<td>$339,337</td>
<td>$595,472</td>
<td>$ -</td>
<td>$ -</td>
<td>$1,937,187</td>
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<tr>
<td>Mill, Patch &amp; Overlay</td>
<td>$296,194</td>
<td>$188,402</td>
<td>$393,636</td>
<td>$542,167</td>
<td>$394,210</td>
<td>$ -</td>
<td>$ -</td>
<td>$1,814,609</td>
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<tr>
<td>Reconstruction</td>
<td>$161,187</td>
<td>$77,900</td>
<td>$120,870</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$659,957</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>$853,580</td>
<td>$1,079,537</td>
<td>$937,066</td>
<td>$967,036</td>
<td>$1,139,460</td>
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<td>$ -</td>
<td>$4,976,679</td>
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<tr>
<td>CC Match (1,000,000 Max 3:1)</td>
<td>$640,185</td>
<td>$809,653</td>
<td>$792,800</td>
<td>$725,276</td>
<td>$854,595</td>
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<td>$ -</td>
<td>$3,732,510</td>
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<tr>
<td>City Match Share</td>
<td>$213,395</td>
<td>$269,884</td>
<td>$234,267</td>
<td>$241,759</td>
<td>$284,865</td>
<td>$ -</td>
<td>$ -</td>
<td>$1,244,170</td>
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</table>

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<table>
<thead>
<tr>
<th>Page No.</th>
<th>Objectives and Measures</th>
<th>Asset Management Plan</th>
<th>LTAP - Table 1</th>
<th>LTAP - Table 2</th>
<th>Maps</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2-3</td>
<td>4-55</td>
<td>56-67</td>
<td>68-78</td>
<td>79-84</td>
</tr>
</tbody>
</table>

**SUMMARY**

- **AVERAGE ANNUAL BUDGET =** $995,336
- **Existing PASER (2016) =** 6.71
- **PROJECTED PASER IN YEAR 2022 =** 7.36
AMP Process

Take your Spreadsheet to the Next Level
Automated Formulas

- Projecting Maintenance Costs for Each Treatment Each Year
- Projected PASER (Future Year)
- Citywide Average PASER (Now and Future)
- Excel allows a broad spectrum of programming
AMP Process

Save Spreadsheet, Copy, and Reformat into Readable Database for GIS to Create Maps
AMP Process

Distill the Data into Easy to Follow Tables and Maps
Keep it Simple....

<table>
<thead>
<tr>
<th>Action</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>TOTALS</th>
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<tbody>
<tr>
<td>HMA + Patching</td>
<td>$201,489</td>
<td>$240,959</td>
<td>$137,019</td>
<td>$85,709</td>
<td>$210,007</td>
<td>$665,176</td>
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<tr>
<td>Mill &amp; Overlay</td>
<td>$167,158</td>
<td>$181,666</td>
<td>$130,085</td>
<td>$203,047</td>
<td>$891,963</td>
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<tr>
<td>Overlay</td>
<td>$130,085</td>
<td>$203,491</td>
<td>$474,111</td>
<td>$807,687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slurry / Chip / Fog seal</td>
<td>$419,832</td>
<td>$465,465</td>
<td>$750,569</td>
<td>$740,601</td>
<td>$3,093,203</td>
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<tr>
<td>Redamite</td>
<td>-</td>
<td>$191,131</td>
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<td>$262,137</td>
<td>$46,189</td>
<td>$723,979</td>
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<td>Crack Seal</td>
<td>$114,917</td>
<td>$126,335</td>
<td>$134,203</td>
<td>$20,323</td>
<td>$395,778</td>
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<tr>
<td>TOTALS</td>
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<td>$1,506,483</td>
<td>$1,515,308</td>
<td>$1,447,043</td>
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</tr>
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</table>
AMP Process

Record Progress and Project Future Needs
Use this to Set Long Term Budget
• Stay the course and keep consistent records
  — Savings start to really materialize the further down the road you get
• Make the output available to constituents to show the programs value.
  — Convert the public to believers
• Use output to make the case for continuing that program
  — Happy public = happy voters!
Rules
• Must Submit an LTAP approved Asset Management Plan
• May submit multiple applications per call
• Eligible up to $1 million
• Must Follow SEPA / ADA / PROWAG
• Scoring is based on connectivity to existing plans, benefit, need, quality, traffic counts, safety, and regional economic significance
• Materials for Chip Sealing and Crack Sealing are eligible for Funding
• Contracts already procured are eligible for funding.
Community Crossings Matching Grant

A Complete Asset Management Plan is Important in Creating a Valid Community Crossing Application
Bidding Process

Standardized Bid Documents available through Engineers Joint Contract Documents Committee (EJCDC)

- AD for bidders, Instructions
- General and Special Conditions
- Proposal / Bid Table
- Bonding
- Local Specs and Testing Requirements
- Whose Responsibilities for what?
- Completion Date
- Insurance
- Indiana State Requirements for Bidding

- Use Standard EJCDC documents for Construction Management
Bidding Process

Exhibit Preparation

- For Accurate and easy to track quantities, use aerials from County GIS and scale in Cad to make exhibits for bid documents
- Use Tables to Organize Quantities by Location
- Use GIS or CAD to Create Exhibits to Clearly Show Scope of Work
Award Using Standard Contract and Awards Documentation through EJCDC

- Get Signed Copies Through LPA Council, Mayor, Contractor and then to INDOT
- Set Pre Construction Meeting and Inspection Responsibilities
- Construction Record Keeping and Payment are Important for Ensuring Proper Reimbursement
- Red Flag Documentation and INDOT Environmental Staff Coordination can be used to meet SEPA
Make Sure the Public is Kept Up to Date on the AMP Progress

- Door Hanger Flyers
- Neighborhood Operations
- Media Notices
- Show that Tax Dollars are Being Spent Prudently on not only paving but preventative maintenance
LPA Responsibilities

• Track Quantities – Do Not Leave This To the Contractor to Avoid Change Orders Created by Over-Cautious Work (Larger ADA Ramps, Deeper Sections)

• Process Payments and Change Orders via EJCDC Forms to Avoid Legal Issues and Miscommunication

• Ensure HMA certifications are provided and hire a material testing firm to ensure quality in random select locations
LPA Responsibilities

- Finalize Quantities and Make Final Payment
- Use Exhibits for as-built notes
- Turn copy of final payment and records to INDOT to ensure compliance with Community Crossing requirements.
Remember

- Track Your Pavement Conditions and Treatments at Least Every Two Years
- Reprioritize and Reevaluate Bid Roads yearly
- Stay committed to process and program –

It Will Pay Off!
Community Crossings Matching Grant – Don’t Forget

IMPORTANT

Community Crossing Contracts Must Be Approved By INDOT by April 15th, 2018

• Awarded projects must be under contract and all documentation submitted by the date above – failure to do so results in you losing your funds.
• Unobligated funds will be forfeited and redistributed during the next call to other local governments with shovel-ready projects
Federal laws that apply
- Permitting – DNR, IDEM, Corp of Army Engineers, etc.
- Americans with Disabilities Act
- Historic preservation

State laws that apply
- I.C. 36-1-12 – Public works projects
- I.C. 8-23-10 – Qualifications of bidders for contracts
- I.C. 5-16-13 – Contractor requirements for public works projects
- Look up Indiana Code at General Assembly website
  http://iga.in.gov

The board may purchase or lease materials in the manner provided in IC 5-22 and perform any public work, by means of its own workforce, without awarding a contract whenever the cost of that public work project is estimated to be less than one hundred fifty thousand dollars ($150,000)...
Contact Information & Questions?

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