Enhanced Pavement Test Data Analysis Methodology
BACKGROUND

- Conventional Destructive Testing Methodologies
  - Requires Traffic Maintenance
  - Labor Intensive
  - Time Consuming
Nondestructive Testing (NDT)

- Advantages of NDT Methodologies
  - More data in less amount of time
  - Improved safety
  - No field samples (i.e., no damage to structure)
Presentation of NDT Data

- Typical Scatter Plot
  - Widely used by engineers
  - Effective for a large amount of data
  - Good for a few survey lines
What If...

- NDT data collected along numerous survey lines
  - ✓ Premature Failure
  - ✓ Forensic Investigation
  - ✓ Others?
Presentation of NDT Data?
Contour Plots

“If Multiple 2-D Plots Are Overwhelming, Contour Mapping Is The Way To Go!”
Concept of Contour Plots

- Contour Plot is a 2-D Representation of a 3-D Plot

2-D Scatter Plot

Contour Plot
Contour Plotting Software

- Commercial Software Available
  - Surfer
  - Dplot
  - Others

- Cost Range Varies for Different Software
- Manuals and Training Sessions Available from Vendors
FDOT Example

- NDT Survey of Airport Hangar Survey
- Premature Pavement Failure
  - ✔ Cracking
  - ✔ Depression/Heaving
- 14 FWD Scan Lines

<table>
<thead>
<tr>
<th>Survey Offsets (ft)</th>
<th>Total Survey Lines</th>
<th>Sampling Interval (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1</td>
<td>Area 2</td>
<td>14</td>
</tr>
<tr>
<td>10, 25, 40, 55, 70, 85, 95</td>
<td>10, 25, 40, 55, 70, 85, 95</td>
<td>10</td>
</tr>
</tbody>
</table>
Scatter Plots???

- There must be a better way!
Contour Plotting

- Map of Pavement Modulus
- Bird’s Eye View
- Easy to Understand
Then What?

- Select Critical Locations for Destructive Testing
  - Penetration Test
  - Dynamic Cone Penetrometer
  - Soil Sampling
Contour Plotting of Survey Area by Nondestructive Testing

Standard Penetration Test

Falling Weight Deflectometer

Selecting Critical Locations for Destructive Testing

Soil Sampling

Dynamic Cone Penetrometer