Concrete Pavement Spectrum
John Cunningham, Iowa Concrete Paving Association
Cities in Iowa typically design concrete pavements for 30 years or more

Can we design concrete pavements for more years?

How about fewer years?

What about concrete overlays?

What design life is the most cost effective?
Mission: Lay out a spectrum of designs that run from 10 years through 50 years. Conduct an economic comparison of the options via LCCA.
Concrete Design Spectrum

10 Years
- New
- Overlay

20 Years
- New
- Overlay

30 Years
- New
- Overlay

40 Years
- New
- Overlay

50 Years
- New
- Overlay
Pavement Design Parameters

- New concrete pavement
- Two-lane residential street
- With or without curb
- Varying concrete strengths
- With or without load transfer
- Varying joint spacings
10 Year Pavement Design
20 Year Pavement Design
40 Year Pavement Design
50 Year Pavement Design
Overlay Design Parameters

- Unbonded concrete overlay of concrete
- Two-lane residential street
- With or without curb
- Varying concrete strengths
- With or without load transfer
- Varying joint spacings
- With or without fiber reinforcement
30 Year Overlay Design
40 Year Overlay Design
50 Year Overlay Design
Pavement Design Spectrum

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<thead>
<tr>
<th>Year</th>
<th>Subbase Thickness</th>
<th>Pavement Thickness</th>
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<tbody>
<tr>
<td>10 Year</td>
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## Overlay Design Spectrum

<table>
<thead>
<tr>
<th>Joint Spacing</th>
<th>Overlay Thickness</th>
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Life Cycle Cost Analysis

- To compare options of different design lives, one must convert to annual costs
  - Equivalent Uniform Annual Cost (EUAC)

- StreetPave’s LCCA component
  - Demonstration
 Designs in this presentation are shown as examples of potential concepts

ICPA can work with your engineer to develop designs for your city’s needs
Questions