How to Win the Pavement Selection Contest

Illinois Asphalt Pavement Association

March 2003
Roadmap

• Efficient reliable transportation
• Focus on reliability
• Doing so will win
• More so in future
Tools

- Quality
- Innovation
- Contract incentives
- Life cycle cost analysis
Quality

- Investments that make the road last
- Investments well worth the cost
Illinois Asphalt Industry
Contract Incentives

- A plus B, lane rental
- Most direct
- Most expensive
- $ here save days
- Quality saves years
Life Cycle Cost Analysis

• Add up the costs over life of design
• Convert to current $
• Select the lowest cost
Life Cycle Cost Elements

- Construction $\\n- Rehabilitation future $
- Delay to traffic time?
Does Delay Cost Business?

- Driver’s wages
- Capital costs
- Delay in arrival of product
Does Delay Cost You?

• Commute to work
• Car full of kids on vacation
• How much is it worth to you?
• Congestion pricing
• Lots of studies
# Delay Hourly Costs

<table>
<thead>
<tr>
<th></th>
<th>Cars</th>
<th>Trucks</th>
<th>Big Trucks</th>
<th>Spouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
<td>$10 to $13</td>
<td>$17 to 20</td>
<td>$21 to $24</td>
<td>$100</td>
</tr>
</tbody>
</table>
Example: I-55 Springfield

- 25,000 ADT
- 15 minutes
- 30 days
I-55 Calculations

• 25000 ADT X .25 hrs = 6,250 hrs/day
• 6,250 hrs X 30 days = 188,000 hrs
• 188,000 hours X $10/hour =

$2 million in user delay
**Perspective**

<table>
<thead>
<tr>
<th></th>
<th>Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehab</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>User Delay</td>
<td>$2,000,000</td>
</tr>
</tbody>
</table>

*Patch and overlay 11 miles @ $500K/Mile*
User Delay on the Brakes
Braking the Bank

- Magnitude makes it difficult
- User delay not considered
Framework for Selection

Cost

Delay

Build

White

Black

Alternative

Build

Delay
A Little More Difficult

![Graph with cost, build, delay, and alternative categories]
More Difficult Yet

![Cost Vs. Alternative Build vs. Delay Graph]
The Right Tool For The Job

- User delay is real $
- Focus long term
- Rather than first cost
- Balance incentives
Not so Obvious

• Delay driving contract incentives
• Selection policies based on delay
• More so in the future
Interstate Traffic Growth

Average Daily Traffic

% Growth

Year

Interstate Loading Growth

Year
% Growth


Traffic
Loading
Compound Annual Growth, 1998 to 2010, US Tons

Modal Growth Rates to 2010:

- Inland Water
- Rail Carload
- Air
- Rail Intermodal
- Truck
- Average All Modes

Growth Rates:

- Rail Carload: 3.2%
- Air: 5.9%
- Rail Intermodal: 4.7%
- Truck: 3.4%
- Average All Modes: 3.4%
- Inland Water: 3.5%
Domestic Freight Tons and Value Approximation
Port Example - Charleston
Highway Flows of International Freight Moving into and From the Port of Charleston
Truck Freight Flows, All Commodities

All truck types; highway freight density in tons
Truck Traffic Growth on Highways, 2020 Density of Incremental US Truck Tons
How to Win

- Recognize user delay is real money
- Make your product minimize delay

*Keep up the focus on quality
More Than Just Winning

Gross Domestic Product
Traffic Growth

Year
Growth %
"You weren't listening. I said, 'DON'T fall.'"
Comes and Goes
Life Cycle Cost Analysis

Life-cycle cost analysis is a process for evaluating the total economic worth of a project by analyzing initial costs and discounted future costs, such as maintenance, user costs, reconstruction, rehabilitation, restoration, and resurfacing costs over the life of the project.
Life Cycle Cost Analysis

\[ NPV = \text{Initial Cost} + \sum_{k=1}^{N} \text{Future Costs}_k \times \left[ \frac{1}{(1 + i)^{n_k}} \right] \]

\[ i = \text{discount rate} \]
\[ n = \text{year of expenditure} \]
Costs

- Construction
- Maintenance
- Rehabilitation
- Accident costs
- Increased fuel
- Increased pollution
- Circuitous travel
- Vehicular costs
- Delay to vehicles
- Etc, etc.
Highway Program
The Black Art of Asphalt Mixes