Contracting for Quality
And Relation to Performance
IN THE BEGINNING

Laying Asphalt on 1st Avenue in Saskatoon, SK (1910’s?)
State of the Art Mix Design

"Recipe" Mix Design

200 lb fine sand
300 lb coarse sand
400 lb crushed gravel
50 lb penetration asphalt

Mix @ 300 F and lay on road
Early Days

Warranties Were Used

New York City Installed 1918 Removed 1964
AASHTO (AASHO)

- 1914 Formation of AASHTO
- Highways are State Responsibility
- Federal Aid instituted 1916
- 23 CFR 635.411
  - Prohibits patented or proprietary products
DESIGN : BID : BUILD

- Becomes standard method of procuring highways

Agency Design
Agency Specifications
Contractor Bid
Low Bid Wins
Definition of Success

“The Contract Specifications Were Met”
PERFORMANCE?

Build to Specifications

Should perform
During construction
2 months old
10 months old
During construction
During construction
5 (?) years old
6 months old
2 months old
11 years old

Happened over one winter
The game is played the way the rules are written.
How Do We Buy Highways?

**Design**
Agency designs using their standards

**Bid**
Contractor bids price for quantity
Low bid wins

**Build**
Contractor builds using Agency material specifications
How Do We Buy Highways?

**Rules**

Design

Bid

Build

Low cost is king

Meet specifications

As enforced
How Do We Buy Highways?

A

+  

B

Material Bid Items

Value of Time (Lane Closure)

Low Bid Sum of A + B
How Do We Buy Highways?

**Rules**

A

Low cost

+ 

Meet specifications
As enforced

B

Speed is Important
How Do We Buy Highways?

\[ A + B + C \]

- **Material Bid Items**
- **Value of Time** (Lane Closure)
- **Warranty**

\[ \text{Low Bid Sum of } A + B \]

\[ \text{Warranty is added requirement} \]
How Do We Buy Highways?

Rules

A + B + C

Low cost

Meet specifications

As enforced

Speed is Important

Performance
Existing JCP with HMA Overlay
Mill to remove overlay
Rubblize Concrete Pavement
Overlay with 12 inches HMA

Built 1998
Northbound 2012
## Project Condition (Age 14 years)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Southbound</th>
<th>Northbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRI Mean (m/km)</td>
<td>0.46</td>
<td>0.47</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>0.57</td>
<td>0.60</td>
</tr>
<tr>
<td>Rut Mean (mm)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>3.3</td>
<td>4.3</td>
</tr>
</tbody>
</table>
Short Term Warranty

Cost

Benefit

Construction Practices
- Instrumented rollers
- Achieving high density
- Thermal segregation

Preventive Maintenance
- Joint treatments
- Reduced permeability emulsion

Design Practices
- SMA Surface
- High modulus asphalt base
- Rich bottom asphalt base
- Stiff subgrade treatment

Materials
- High polymer asphalt
- High delta Tc asphalt
- Premium aggregates
Short Term Warranty

Cost Benefit

Promotes Construction Quality

Construction Practices

Instrumented rollers
Achieving high density
Thermal segregation
Long Term Warranty
Promotes Innovation
Cost Benefit

Construction Practices
- Instrumented rollers
- Achieving high density
- Thermal segregation

Preventive Maintenance
- Joint treatments
- Reduced permeability emulsion

Materials
- High polymer asphalt
- High delta Tc asphalt
- Premium aggregates

Design Practices
- High modulus asphalt base
- Rich bottom asphalt base
- Stiff subgrade treatment
The game is played the way the rules are written
Push versus Pull

- **Current Specifications** push the contractor towards “good performance”
- **Warranty Specifications** define good performance

“How far can you 'push a rope'? Not very far. That's why true influencers don't push.”

~ Bob Burg
SURE LOOKS GOOD TO ME!

THANK YOU