

## Cost Saving Tips for Concrete Paving Projects

Heath J. Schopf P.E.  
Director of Construction Engineering

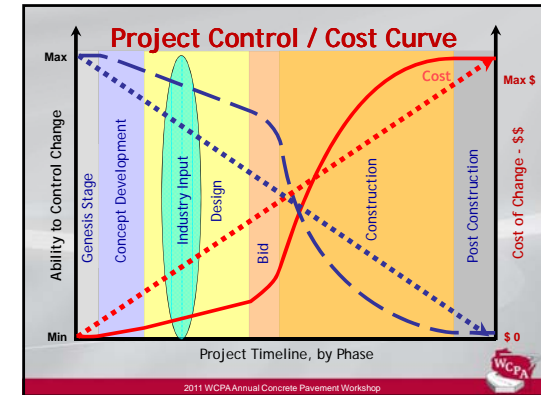


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Concrete Pavements have risen to the challenge in a time where reduced funding requires infrastructure improvements to do more with less. Assuring the Lowest cost for your next long-term concrete pavement project requires a collaborative effort between the owner, designer and contractor.

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## Achieving the Lowest Cost

1. Have a plan.
2. Start a program – Educate and inform stakeholders.
3. Early communication with industry and engineers for input, recommendations, support and constructability.
4. Design for construction efficiencies.
5. Define quality requirements and expectations.
6. Contract wisely.
7. Build for longevity.
8. Communicate the successes.

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## 1. Have a Plan

- Pavement management – Know what you have.
- Identify project type.
- Prioritize projects.
- Asset management – Mix the fixes.

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## Identify Project Type

- Reconstruction
- Intersection Improvement / Roundabout
- Concrete Overlay
- Rehabilitation
  - Concrete Pavement Partial Depth Repair
  - Concrete Pavement Full Depth Repair
  - Diamond Grinding
  - Dowel Bar Retrofit

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## Mix the Fixes

- Program short and long-term fixes to minimize overall costs.
- Lower cost, short term fixes on low priority streets may enable a long term capital investment for a high priority street.

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## 2. Start a Program

- Commit to a scheduled paving program
- Build stakeholder support
  - Educate and inform stakeholders
  - Program and build high visibility streets
  - Publicize the benefits
  - Focus on long lasting improvement not the temporary inconvenience.

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## 3. Early Communication with Industry and Engineers

- Contact your local industry representative for input, recommendations, support, and constructability issues.
- For industry the best promotion comes from strong technical support.
- Secure the services of a Professional Engineer. Their knowledge of the programming, design and construction process will save you money.

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## 4. Design for Construction Efficiencies

- Optimize pavement thickness design.\*
- Optimize design for slip-form paving operations.\*
- Reduce staging.\*
- Understand benefit/cost of design features.\*
- Provide clear and accurate plans.\*
- Work ahead on utility relocation and R/W acquisition.

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## Optimize Pavement Thickness Design

- Utilize standard design procedures.
- Know your foundation – Uniformity is the key.
- Acquire accurate design input data: Soils, ADTT, % growth, design life, etc.
- Understand costs/inch:
  - Fixed or static costs (Mobilization, Equipment, Labor).
  - Material costs (Thickness): 1-inch increase in thickness may increase SY unit cost between 5 & 10%.

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## Optimize Design for Slip-form Paving Operations

- Increased production.
  - Hand-formed vs. slip-formed placement may increase SY unit costs between 30 & 50%.
- Provide consistent widths – Longitudinal construction and contraction joints.
  - Avoid variable width pavements.
  - Avoid pavement width changes.
  - Pavement width changes decrease production and increase paver setup or mobilization costs.

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## Optimize Design for Slip-form Paving Operations

- Provide typical minimum clearance requirements.
  - Outside = 2.5 feet min. for track line.
  - Inside/Centerline = 4 feet min for 3 feet offset.
- Eliminate gaps.
  - Consider closing gaps for a short period of time by paving through with HES concrete.

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## Reduce Staging

- Providing the opportunity for increased production will decrease overall costs.
- Get In – Get Out – and Stay Out.
- Consider economic impact to businesses with roadway being closed for a short amount of time vs. staged for a longer period of time.
  - Provide signage, parking, and alternate route.
- Improves construction and ride quality.

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## Understand Benefit/Cost of Design Features

- Provide the contractor with the option of placing curb and gutter integral with the pavement.
  - Integral C&G may decrease LF unit costs between 40 & 50%.
- Load transfer doweled joints.
  - Doweled transverse joints are typically only required when ADTT is over 75.
  - Dowels may increase SY unit costs between 10 & 20%.

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## Understand Benefit/Cost of Design Features

- Consider “Fast Track Paving” concept vs. HES or SHES concrete.
  - Allows contractor to incorporate schedule into mix design to accommodate strength gain requirements.

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## Provide Clear and Accurate Plans

- Typical plan requirements:
  - Project overview.
  - Typical sections.
    - Clear material limits and thickness.
    - Standard and consistent curb types.
    - Consistent pavement widths and identify longitudinal joint locations.
    - Cross slope matched to equipment capability and ride comfort.

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## Provide Clear and Accurate Plans

- Special details.
  - Try and avoid whenever possible.
  - Provide bid item, caution on incidental.
- Traffic control.
  - Provide sufficient clearances for equipment, work space, and safety.
- Paving/Plan/Alignment details.
  - Alignments, intersection and super-elevation data.
  - Project match lines.
  - In-pavement structures (inlets, manholes, etc.).
  - Curb types (consistent).

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## Provide Clear and Accurate Plans

- Miscellaneous quantities.
  - Accurate.
  - Use undistributed judiciously.
  - Clearly defined limits.
  - Differentiate HES from regular PCC.
  - Special details match special items.
  - Plan sheets coincide with quantities.

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## 5. Define Quality Requirements & Expectations

- Project specifications
  - The main purpose of a specification is to define the project owners quality requirements and expectations and communicate them to the construction contractors.
  - Current concrete specifications incorporate method and performance specifications to define these quality requirements and expectations.

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## Project Specifications

- Establish material quality requirements.
- Account for local availability of materials.
- Incorporate current industry practices.
- Allow the contractor to utilize innovative materials and techniques.
- Provide a means for consistent quality requirements resulting in enhanced bid-ability.

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## Special Provisions

- Prosecution and progress.
- Traffic handling.
  - Traffic control
  - Staging
  - Clearance requirements.
- Utilities (status).
- Completion dates.
  - Whenever possible provide flexibility on scheduling. Utilize working days rather than completion date.

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## Special Provisions

- Substantial completion (be specific).
- Non-standard pay items.
  - Caution on word incidental.
  - Specifics on what's included.
  - Payment approach.

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## 6. Contract Wisely

- Use standardized specifications (Iowa DOT or Urban Design Standards and Specifications).
- Bid the project early when contactors have time to bid and need the work.
- Take advantage of surrounding concrete projects being bid in your area.
- Take advantage of the "economy of scale" and package small projects into one contract.

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## More Contract Wisdom

- If you need to consider pavement type be sure to evaluate the total cost of building, operating, and maintaining pavements of comparable structural design over the life of the facility. LCCA
- Remember – Most often the municipality pays for the maintenance of the street.
- Use the power of competition.
- Advertise with ICPA.

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## 7. Build for Longevity

- Consider the benefit/cost of incentives.
- Look at curb milling instead of curb cuts at driveways and curb ramps.
- Field review jointing layouts.
- Backfill ASAP.
- Consider integral color vs. dry shake.
- Eliminate stamped concrete in roadway.
- Consider sod vs. seed.

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## 8. Communicate!!

- Make Concrete Paving a positive event.
- Conduct pre-paving and weekly progress meetings.
- Meet regularly with all parties directly affected by the project before, during, and even once after construction.
- Use the media to your advantage.
- Communicate your success!!

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CONCRETE STREET!**

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## Discussion & Questions

For Additional Information Contact:

Wisconsin Concrete Pavement Association  
2423 American Lane, Suite 2  
Madison, WI 53704

Phone: 608-240-1020  
Fax: 608-240-1019

[www.wisconcrete.org](http://www.wisconcrete.org)

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