Pavement Type Selection and Alternate Pavement Bidding

KYTC Partnering Conference

August 10, 2010

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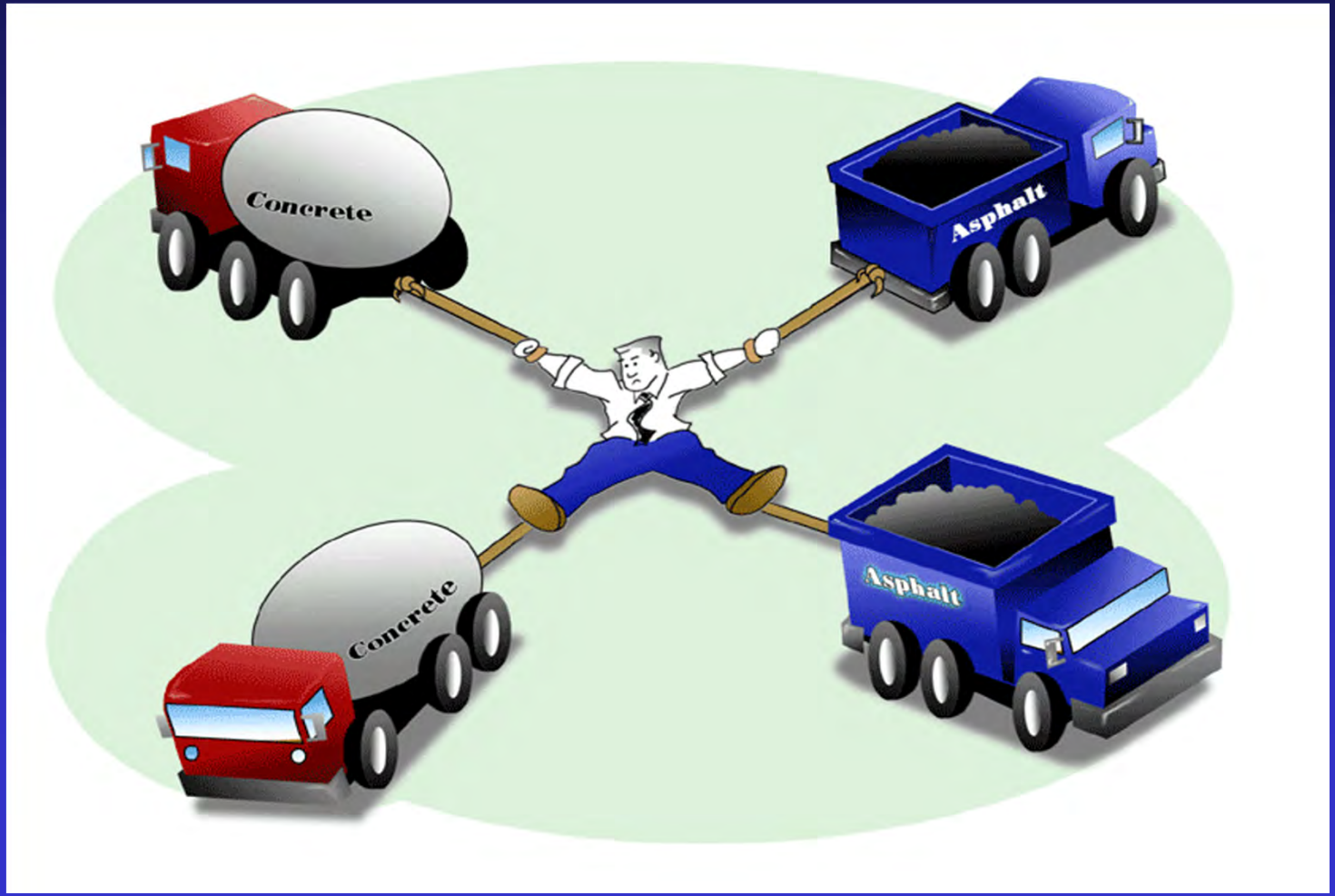
Division of Highway Design

Pavement Type Selection Is One Large Tug-of-War



Primary Goals For Pavement Type Selection

- Provide Well Performing, Durable, Safe and Cost Effective Pavements
- Provide Fair And Equitable Treatment Between Industries
- Stimulate Competition

Why Competition?

- The Cabinet saves 15-20% on average on projects where there is more than 1 bidder
- Competition fuels innovation

Original KYTC Policy

- Effective October 2003
- Interstates, Parkways, NHS Routes
- Other routes
  - $\geq$ 5,000 ADT
  - $\geq$ 5,000,000 ESALs
- No stipulation for alternate bidding

2006 Update

- Added Type Selection Factors
- Added Specific LCCA Details
- Alternate Bidding Allowed
  - Included Bid Adjustment Factor
    - Sum of out-year rehab costs for each alternate
    - $ amount added to bids for award analysis only

2009 Update

- Expanded Scope of Projects
  - 2,500 ADT
  - 1,000,000 ESALs
- Alternate Bid when LCCA is within 20%
  - LCCA is only pavement items
- Alternate Bid when there are no overriding engineering factors

What Projects Apply?

- Greater than 1-mile in length
- New Construction
- Reconstruction
- Major Widening
- Pavement Rehabilitation

What Projects Apply?

- Interstates
  - Greater than 1 ½” grade change or 2” milling
- Parkways and other NHS Routes
  - Greater than 4” of new pavement
- Other Routes
  - Greater than 4” of new pavement
  - 2,500 ADT or 1,000,000 ESALs

Type Selection Factors

Primary Factors

- **Traffic**
- Soil Characteristics
- Weather
- **Construction considerations**
- Recycling
- **Cost comparison**
  - Initial
  - Life Cycle

Secondary Factors

- **Performance of similar pavements in the area**
- **Adjacent existing pavements**
- Conservation of materials & energy
- Availability of local materials/contractors
- Traffic safety
- Experimental features
- Stimulation of competition
- Municipal preference

KYTC Alternate Bid Projects

2006-2010

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Update for Jobs Thru January 2010 with LCCA Bid Adjustment Factor

- 18 Alternate Projects to Date ($405.7M)
  - 17 Full Depth ($356,293,543)
  - 1 Widening/Rehab ($49,451,314)
- Full Depth
  - 15 Asphalt Awards ($318,346,778)
  - 2 Concrete Awards ($37,946,765)
- Widening/Rehab
  - 1 Asphalt Award ($49,451,314)

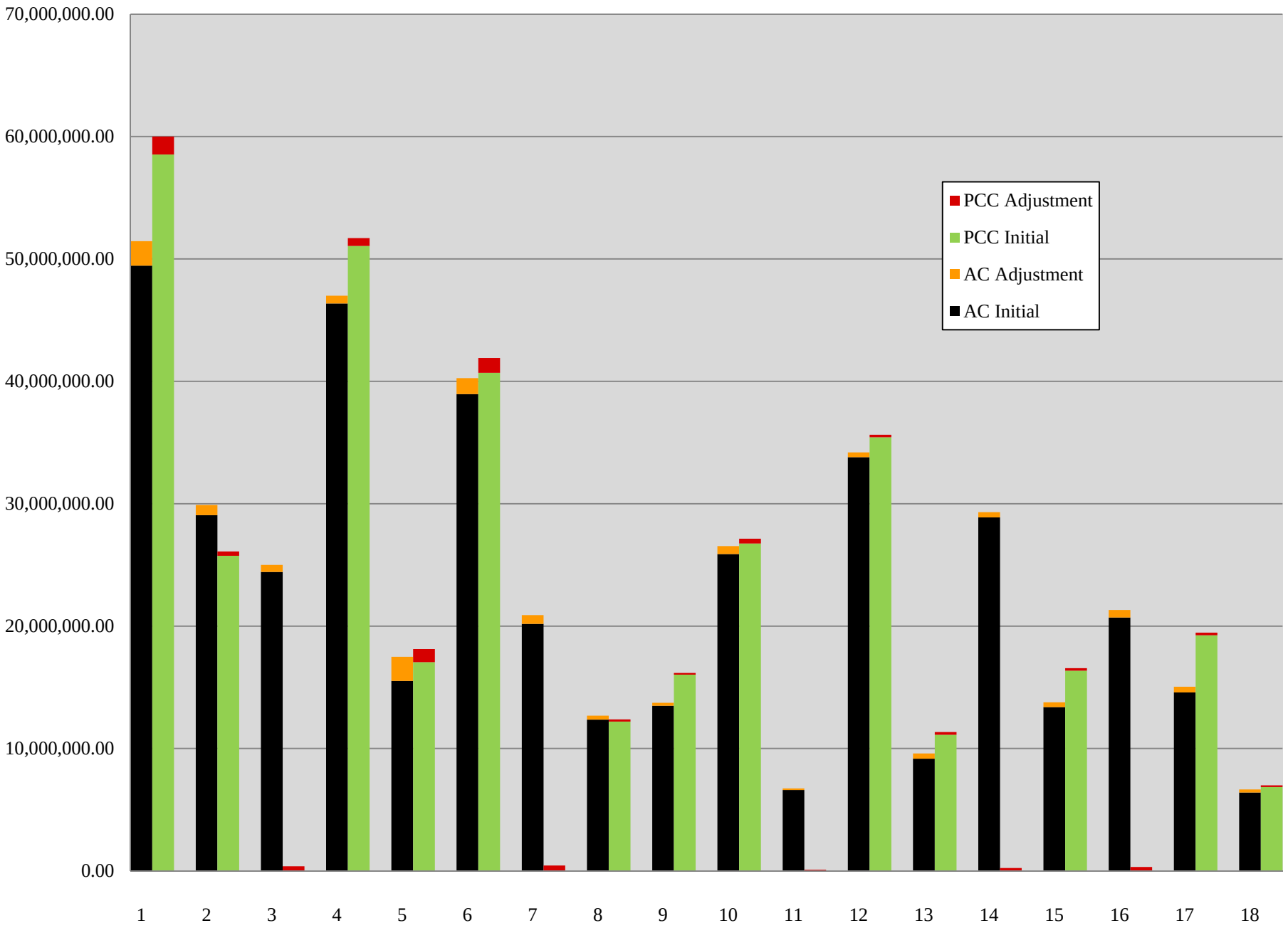
Alternate Bidding

- Project Construction Estimates Range
  - $8 Million to $50 Million
- Bid Adjustment Range
  - $95,000 to $2,000,000
  - 0.60% to 4% of total project estimate

Alternate Bid Results

- 13 of 18 projects had AC and PCC bidder(s)
- Bid Adjustment Factor did not determine low bid in any of the 18 projects

KYTC Alternate Bids 2006-2010



KYTC Alternate Bids

- Average 4.6 bidders per project
  - All Paving Projects Average 2 bidders (2009)
- Minimum 2 bidders (2 projects)
- Maximum 8 bidders

Low Bid vs. Engineer's Estimate

Alternate Bids(2009)

- Average Difference: -20.5%
- Maximum Difference: -30.7%
- Minimum Difference: -9.7%

All Bids* (2009)

- Average Difference: -8.9%
- Avg. Diff. Single Bid: -1.5%
- Avg. Diff. Multi Bid: -18.4%

*Awarded Projects (Inc. Alt. Bid)

KYTC Paving Projects 2009

- 56% Single Bid (226 of 401)
- 52% Single Bid > Engineer's Estimate (117)
- 96% Multi Bid < Engineer's Estimate (167 of 175)

KYTC Paving Projects 2009

- Single Bid Projects
  - $363,000 less than Estimates ($151 M)
  - 0.24%
- Multiple Bid Projects
  - $114 M less than Estimates ($567 M)
  - 20.1%
- Alternate Bid Projects
  - $52 M less than Estimates ($256 M)
  - 6% of multi bid projects, 45% of savings

Design Issues

- Minimize competing products on alternates
- Shoulders
  - Reduced structure shoulders
    - Asphalt with Asphalt shoulders
    - Concrete with Concrete shoulders (6”)
    - Concrete with Asphalt shoulders
  - Roller Compacted Concrete (RCC)

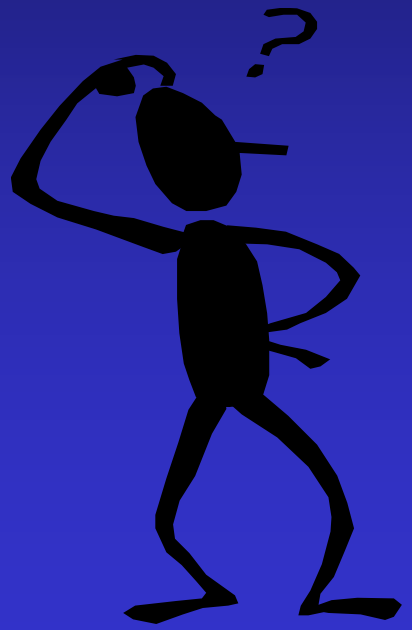
Project Team Issues

- Maintenance of Traffic/Constructibility
  - What do we really need?
  - What will be allowed during construction?
- Future maintenance

What Next?

- Continue Alternate Bidding in 2010
  - 10 to 15 projects identified
- Meeting(s) with Industries
  - April & June of 2010
  - Both don’t like alternate bidding but had suggestions to improve
- Continue to evaluate process
  - LCCA (Bid Adjustment)
  - Competition

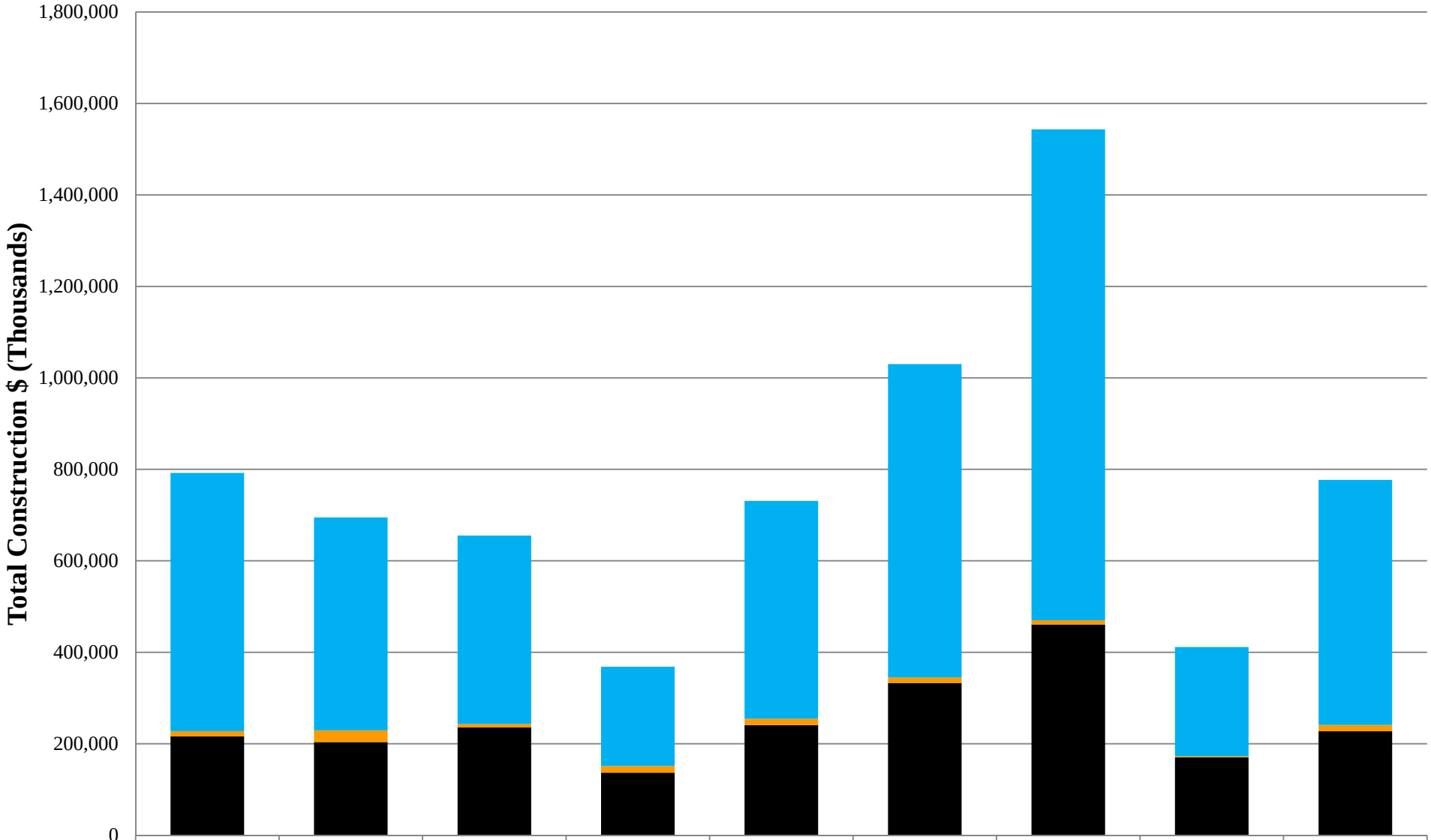
Questions?



KYTC Mission Statement

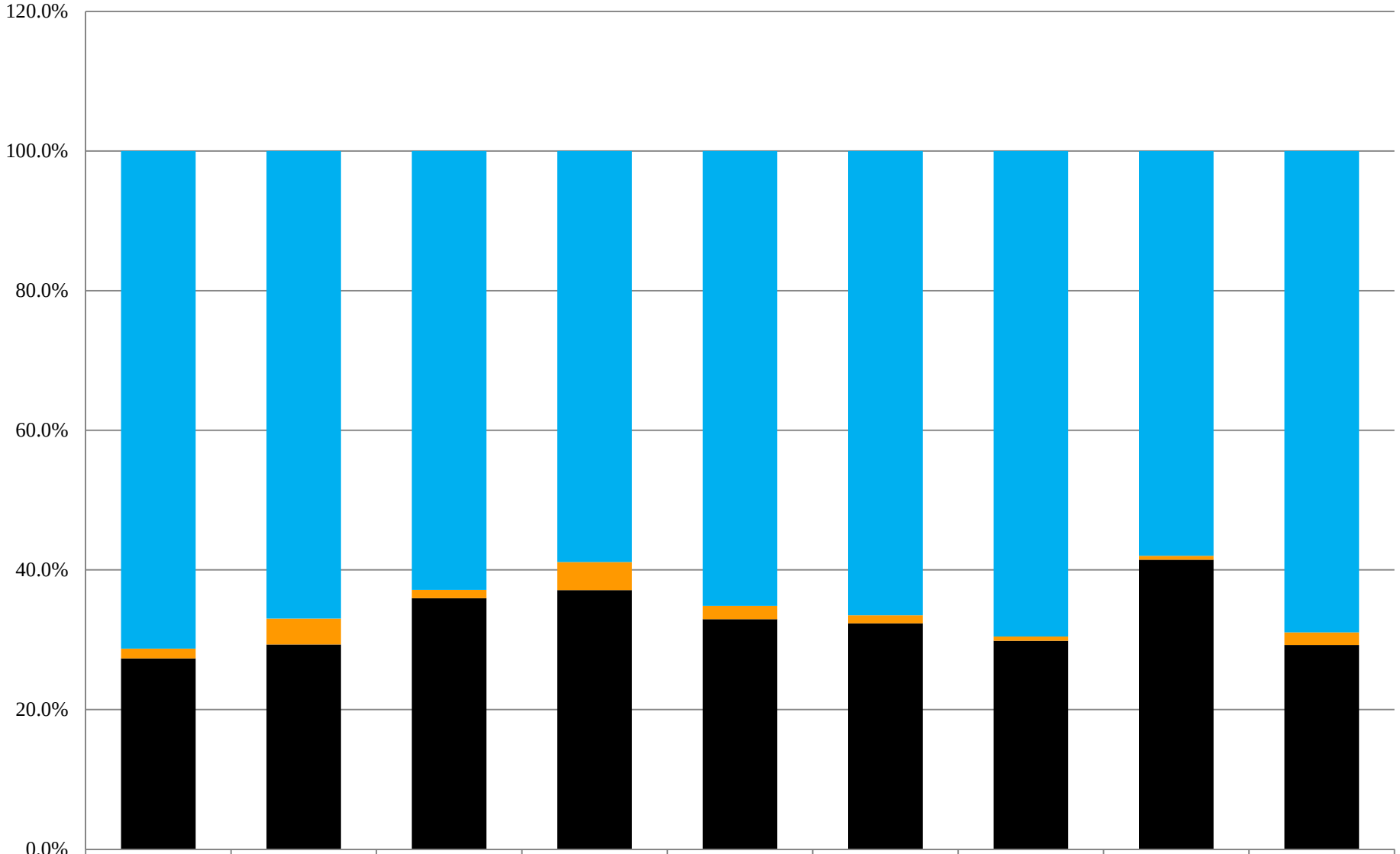
"To provide a safe, secure, and reliable highway system that ensures the efficient mobility of people and goods, thereby enhancing both the quality of life and the economic vitality of the Commonwealth."

Total $ Asphalt and Concrete Pavement 2001-2009



	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other	$564,602,267	$465,419,810	$411,965,514	$216,912,610	$476,316,000	$684,950,793	$1,073,369,956	$238,595,023	$535,807,414
Concrete	$11,179,197	$25,692,310	$7,693,695	$14,803,000	$13,854,000	$11,979,000	$9,357,692	$2,290,700	$13,899,731
Asphalt	$216,432,761	$203,745,487	$235,599,267	$136,694,000	$240,830,000	$333,083,000	$460,715,440	$170,633,684	$227,292,855

Percent of Total Construction $
AC & PCC (2001-2009)



	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other	71.3%	67.0%	62.9%	58.9%	65.2%	66.5%	69.5%	58.0%	69.0%
Concrete	1.4%	3.7%	1.2%	4.0%	1.9%	1.2%	0.6%	0.6%	1.8%
Asphalt	27.3%	29.3%	36.0%	37.1%	32.9%	32.3%	29.8%	41.5%	29.3%

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PAVEMENT DESIGN GUIDENCE

Document Name	FileType
Pavement Design Guide(2007Update)	PDF
Appendix A.Examples	PDF
Appendix B. Special Notes and Special Provisions	PDF
Appendix C. General Pavement Design Notes	PDF
Appendix D. Warrants for Selecting Asphalt Mixtures	PDF
Appendix E. Pavement Type Selection Policy	PDF
Pavement Design Spreadsheet (V5.03--Updated 4/2/08)	Excel

LINKS OF INTREST

- **Kentucky Transportation Center**
- **FHWA Pavement**
- **Traffic Forecasting**
- **Geotechnical Reports**

The Pavement Branch in the Division of Highway Design is responsible for overseeing the development of pavement structural designs for all Kentucky Transportation Cabinet projects. The Pavement Branch staff is available to assist District Offices and Consultant Engineers in developing pavement designs.

Staff in the Pavement Branch manages pavement rehabilitation and reconstruction projects on all Interstate, Parkway and National Highway System routes.

PAVEMENT DESIGN REFERENCES

Kentucky Transportation Center Reports:

UKTRP-81-17 "Design Guide for Bituminous Pavement Structures"
UKTRP-84-3 "Thickness Design Curves for Portland Cement Concrete Pavements"
UKTRP-87-26 "Breaking and Seating of Rigid Pavements"
UKTRP-87-29 "Pavement Designs Based on Work"

Applicable Special Notes:

Special Note 10B "Special Note for Geogrid Used for Reinforcement of Subgrade and Aggregate Base Courses"
"Special Note for Perforated Pipe-4 Inch for Aggregate Backfilled Trench"
"Special note for Pavement Surface drainage Outlet"

http://www.transportation.ky.gov/design/design.asp


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It Don't Matter if its
BLACK OR WHITE

“Is there a better way to decide?”