

Alternative Bidding by Pavement Type

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Background - Obsolete Guidance

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- October 8, 1981 Federal Registry, p. 49842
 - Alternative bidding permitted for equivalent designs.
- November 9, 1981 Federal Registry Clarification, p. 55253
 - Discouraged the use of Price Adjustment Clauses with alternative bidding.
- April 8, 1999 - 23 CFR 626 Non-Regulatory Supplement
 - Alternative bidding to determine mainline pavement type not encouraged, due to difficulty in developing truly equivalent pavement designs
 - <http://www.fhwa.dot.gov/pavement/cfr06261.cfm>
- These documents range in length from 1 - 3 pages in length

Background – Obsolete Guidance

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- November 13, 2008 Memo
 - Clarification of FHWA Policy for Bidding Alternative Pavement Type on the National Highway System
 - <http://www.fhwa.dot.gov/pavement/081113.cfm>
 - Previous guidance is summarized.
 - Price Adjustments for pavement types based on a Life Cycle Cost Analysis (LCCA) is given an experimental approval process.
 - Notification that additional guidance is under review and development.

11/4/2016 Clarification of FHWA Policy for Bidding Alternate Pavement Type on the National Highway System - Pavements - Federal Highway Administration

Pavements

Clarification of FHWA Policy for Bidding Alternate Pavement Type on the National Highway System

This document is superseded by [Use of Alternate Bidding for Pavement Type Selection \(T5040.39\)](#) on 12/20/2012

 Memorandum

U.S. Department of Transportation
Federal Highway Administration

Subject: **INFORMATION:** Clarification of FHWA Policy for Bidding Alternate Pavement Type on the National Highway System Date: November 13, 2008

From: /s/ Original signed by:
Peter J. Stephanos
Director, Office of Pavement Technology Refer To: HIPT

To: Associate Administrators
Chief Counsel
Directors of Field Services
Federal Lands Highway Division Engineers Resource Center Director
Division Administrators

Recent changes in pavement materials costs have impacted the competitive environment relative to the determination of the most cost effective pavement structure for a specific project. In response, State highway agencies (SHA's) have a renewed interest in using alternate pavement type bidding procedures to determine the appropriate pavement type. The FHWA policies relative to pavement design, pavement type selection, economic analysis, and alternate bidding procedures are distributed among several resources. The intent of this memorandum is to consolidate and clarify FHWA policy relative to alternate pavement type bidding procedures on National Highway System (NHS) projects. In accordance with Title 23 U.S.C. 109(o), contracting agencies may use State design and construction standards, including alternate pavement type bidding, for Non-National Highway System projects.

Guidance on alternate pavement type bidding procedures is contained in 23 CFR 626 Non-Regulatory Supplement. It states that "FHWA does not encourage the use of alternate bids to determine mainline pavement types primarily due to the difficulty in developing truly equivalent pavement designs". It further states that "In the rare instances where the use of alternate bids is considered, the SHA's engineering and economic analysis process should clearly show there is no clear cut choice between two or more alternatives having equivalent designs. Equivalent design implies that each alternative will be designed to perform equally, and provide the same level of service, over the same performance period, and has similar life-cycle costs."

The FHWA Pavement Type Selection Policy published in the Federal Register on November 9, 1981, states "where (engineering and economic) analysis shows that two or more initial designs and their forecasted performance are determined to be comparable (or equivalent), the use of alternate bids may be permitted as requested by the contracting agency."

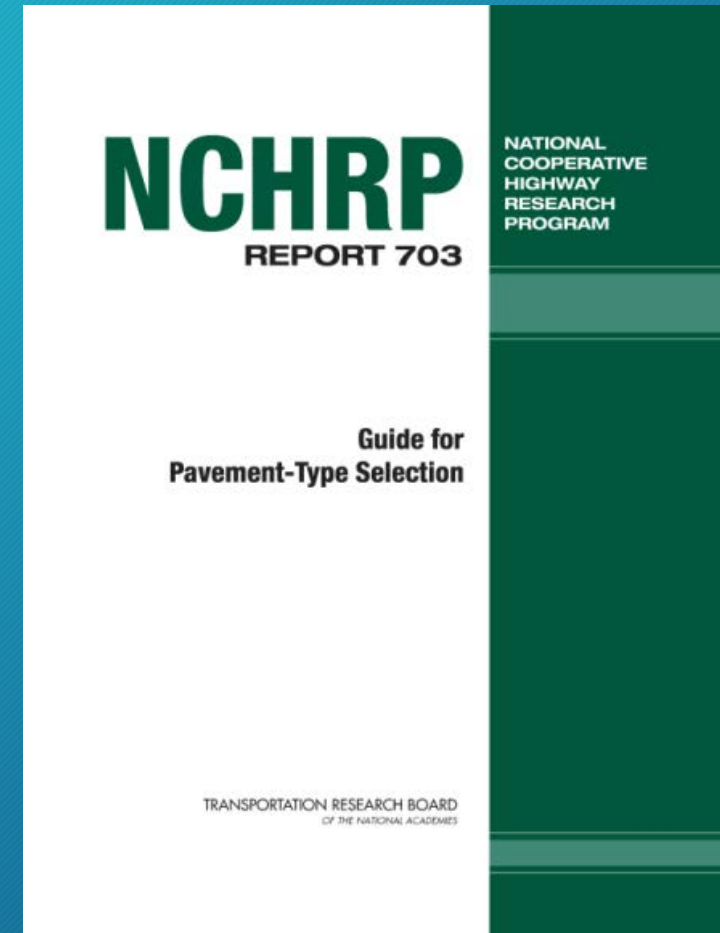
<http://www.fhwa.dot.gov/pavement/081113.cfm> 1/3



NCHRP 703 - Guide for Pavement-Type Selection

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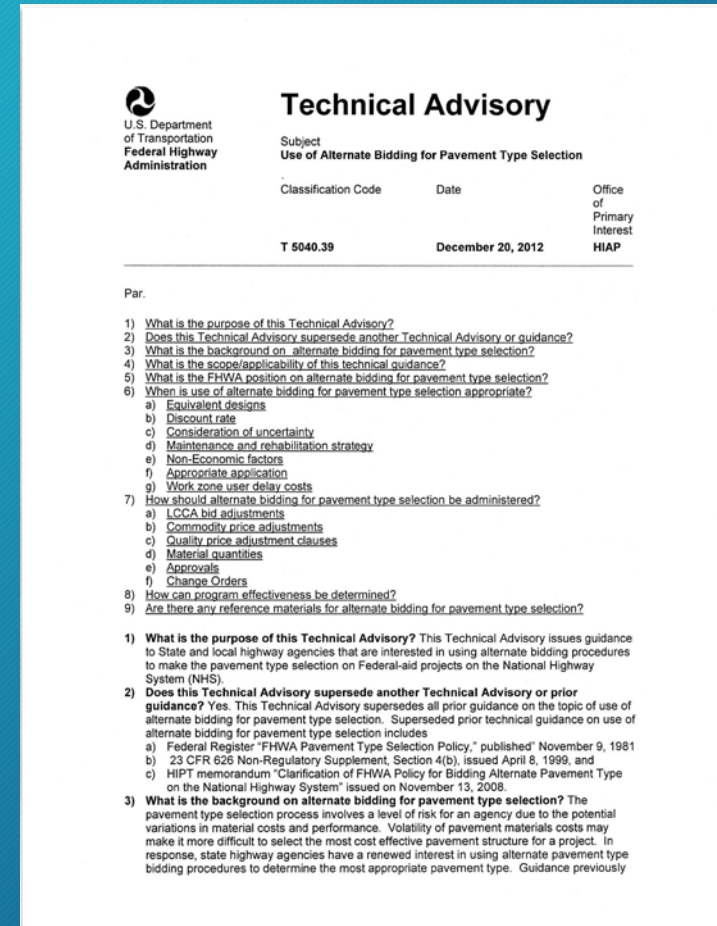
- Published in 2011.
- 70 pages
- Guidance on:
 - Pavement Life-Cycle Strategies
 - Life Cycle Cost Analysis
 - Analysis of Economic and Non-Economic Factors
- <http://www.trb.org/Publications/Blurbs/165531.aspx>



Technical Advisory T 5040.39 Use of Alternative Bidding for Pavement Type Selection

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- Issued December 2012
 - Instructional Memorandum 3.505
Attachment A - Alternative Bids
- Resends previous FHWA Policy
- FHWA considers alternative bidding by pavement type suitable for determining pavement type when an engineering and economic analysis does not indicate a clear choice between different pavement designs.
- <http://www.fhwa.dot.gov/pavement/t504039.cfm>



The image shows the cover page of a Technical Advisory document. At the top left is the U.S. Department of Transportation Federal Highway Administration logo. To the right, the title 'Technical Advisory' is prominently displayed. Below the title, the subject is 'Use of Alternate Bidding for Pavement Type Selection'. A table provides the classification code 'T 5040.39' and the date 'December 20, 2012'. The office of primary interest is listed as 'HIAP'. The document is dated 'December 20, 2012'. Below the header, the text 'Par.' is followed by a list of questions and answers regarding the purpose, applicability, and background of the advisory. The questions cover the purpose of the advisory, whether it supersedes other guidance, the background on alternate bidding, the FHWA position on alternate bidding, when alternate bidding is appropriate, how it should be administered, and how program effectiveness can be determined. The answers provide detailed information on these topics, including references to previous guidance and the National Highway System (NHS).

**U.S. Department of Transportation
Federal Highway Administration**

Technical Advisory

Subject
Use of Alternate Bidding for Pavement Type Selection

Classification Code	Date	Office of Primary Interest
T 5040.39	December 20, 2012	HIAP

Par.

- 1) **What is the purpose of this Technical Advisory?**
- 2) **Does this Technical Advisory supersede another Technical Advisory or guidance?**
- 3) **What is the background on alternate bidding for pavement type selection?**
- 4) **What is the scope/applicability of this technical guidance?**
- 5) **What is the FHWA position on alternate bidding for pavement type selection?**
- 6) **When is use of alternate bidding for pavement type selection appropriate?**
 - a) Equivalent designs
 - b) Discount rate
 - c) Consideration of uncertainty
 - d) Maintenance and rehabilitation strategy
 - e) Non-Economic factors
 - f) Appropriate application
 - g) Work zone user delay costs
- 7) **How should alternate bidding for pavement type selection be administered?**
 - a) LCCA bid adjustments
 - b) Commodity price adjustments
 - c) Quality price adjustment clauses
 - d) Material quantities
 - e) Approvals
 - f) Change Orders
- 8) **How can program effectiveness be determined?**
- 9) **Are there any reference materials for alternate bidding for pavement type selection?**

1) **What is the purpose of this Technical Advisory?** This Technical Advisory issues guidance to State and local highway agencies that are interested in using alternate bidding procedures to make the pavement type selection on Federal-aid projects on the National Highway System (NHS).

2) **Does this Technical Advisory supersede another Technical Advisory or prior guidance?** Yes. This Technical Advisory supersedes all prior guidance on the topic of use of alternate bidding for pavement type selection. Superseded prior technical guidance on use of alternate bidding for pavement type selection includes:

- a) Federal Register "FHWA Pavement Type Selection Policy," published November 9, 1981
- b) 23 CFR 626 Non-Regulatory Supplement, Section 4(b), issued April 8, 1999, and
- c) HIPT memorandum "Clarification of FHWA Policy for Bidding Alternate Pavement Type on the National Highway System" issued on November 13, 2008.

3) **What is the background on alternate bidding for pavement type selection?** The pavement type selection process involves a level of risk for an agency due to the potential variations in material costs and performance. Volatility of pavement materials costs may make it more difficult to select the most cost effective pavement structure for a project. In response, state highway agencies have a renewed interest in using alternate pavement type bidding procedures to determine the most appropriate pavement type. Guidance previously

I.M. 3.505

Attachment A (page 7)

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- Alternative Bids by Pavement Type allowable if:
 1. LPA's Engineering and Economic Analysis does not indicate a clear choice between essentially equivalent pavement types.
 2. Pavement costs are a significant project cost and will have an impact on low bids.
 3. Pavement alternative is bid using DS-15004, Best Value Alternative (A-D) Bidding.
 - "D" is the difference between Net Present Values (NPV) of two alternative pavement types.
 - LPA will calculate "D" value using a Life Cycle Cost Analysis (LCCA) following guidance in FHWA's Technical Advisory on Alternative Bidding for Pavement Types Selection, T 5040.39
- Recommended Approach for Locally Let Alternative Bidding by Pavement Type Projects

Technical Advisory T 5040.39

Factors to Consider

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- Equivalent Designs
- Discount Rate
- Consideration of Uncertainty
- Maintenance and Rehabilitation Strategy
- Non-Economic Factors
- Appropriate Application

Factors to Consider Equivalent Designs

- Equivalent Designs Provide:
 - Similar Level of Service over the Same Performance Period
 - At least one major rehabilitation cycle is included
 - Have Similar Life-Cycle Costs
 - Net Present Value for higher cost alternative is less than 10% greater than the lower cost alternative.
- Equivalent Design Tools:
 - AASHTOWare® DARWin-ME™ -- Detailed program inputs and a \$5,500 annual fee
 - SUDAS Section 5F-1 - Pavement Thickness Design
 - Pavement Industry design programs
- Designs equivalent to the maximum extent possible.

Factors to Consider Discount Rate

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- Life-Cycle Cost Analysis should estimate future costs in Net Present Values
- Use the Real Interest Rate (inflation removed) from the Office of Management and Budget (OMB) Circular A-94, Appendix C:
- https://www.whitehouse.gov/omb/circulars_a094/a94_appx-c
- Additional FHWA Guidance:
 - Life-Cycle Cost Analysis in Pavement Design - Interim Technical Bulletin (September 1998)
 - Pavement Life Cycle Analysis Framework (July 2016)

Factors to Consider Uncertainty

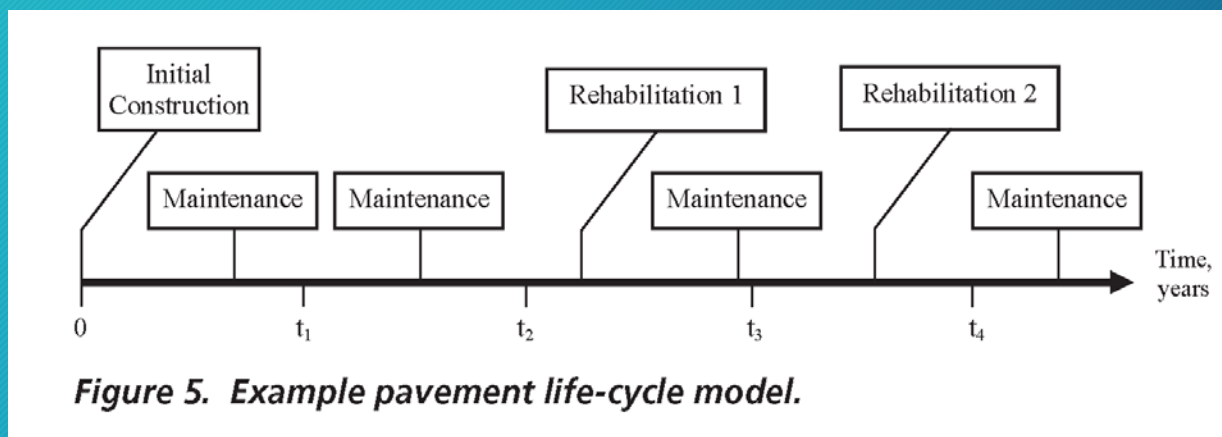
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- Consider in the development of a Life-Cycle Cost Analysis (LCCA):
 - Performance Life
 - Materials Costs
 - Construction Duration
 - Future Actions
- LCCA Tools
 - FHWA's RealCost Software Program
 - <http://www.fhwa.dot.gov/infrastructure/asstmgmt/lccasoft.cfm>
 - LPA developed spreadsheet
 - Pavement industry software

Factors to Consider Maintenance and Rehabilitation Strategy

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- Each Pavement Alternative must include an evaluation of the LPA's Maintenance and Rehabilitation Strategy that:
 - Reflects the owner's current practices
 - Utilizes real data from the owner's pavement management system
 - System can be historical data on pavement maintenance costs
 - Alternatively it could be from a sophisticated system



Factors to Consider Maintenance and Rehabilitation Strategy

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- Costs need to be comparable in today's dollars for similar periods in a pavement's life-cycle.
 - Rehabilitation of PCC pavement in 1996 vs. rehabilitation of ACC pavement of similar age and condition in 2006
- NCHRP Report 703, Guide for Pavement Type Selection, Section 3.5 describes an approach for developing Maintenance and Rehabilitation strategies.

Factors to Consider Non-Economic Factors

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- A LPA may consider the impact non-economic factors such as:
 - Constructability
 - Continuity of adjacent pavements
 - Available of local materials
 - Experience
 - Conservation of materials

Factors to Consider Appropriate Application

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- Alternative bidding by pavement type should only be used where pavement items are likely to influence the low bid on the project.
- Do not use on project where there are substantial:
 - Non-pavement items
 - Quantity differences of different pavement items.

Administration of Alternative Bidding Projects

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- LCCA Bid Adjustment
- Commodity Price Adjustment
- Quality Price Adjustment Clauses
- Material Quantities
- Approvals and Change Orders

Administration of Alternative Bidding Projects

LCCA Bid Adjustment

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- Utilize DS-15004, Best Value Alternative (A-D) Bidding
 - http://www.iowadot.gov/specifications/dev_specs/2015/DS-15004.pdf
- LCCA Determines the “D” value used in DS-15004
- The Net Present Value of all unique costs for future Maintenance and Rehabilitation activities over the performance period are considered.
- **“D” Value must be published in bidding documents.**
 - Locally let projects must also publish the “D” value.
- “D” Value adjustment does not include non-agency costs:
 - Work Zone User Delay
 - Vehicle Operating Costs
 - Environmental Costs

Administration of Alternative Bidding Projects Commodity Price Adjustments

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- Difficult to administer equal treatment to alternative materials.
- Not desirable in Alternative Bidding Projects.

Administration of Alternative Bidding Projects

Quality Price Adjustment Clauses

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- Incentive / Disincentive Clauses must be similar for all alternatives.
- Examples:
 - Smoothness
 - Pavement Thickness

Administration of Alternative Bidding Projects

Material Quantities

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- Same method of measurement should be used for all alternatives.
 - Section 2303 allows for payment of asphalt by area.
- Payment by weight or mass may result in in material cost overruns
 - Higher agency costs from material overruns may invalidate the LCCA.

Administration of Alternative Bidding Projects Approvals and Change Orders

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- Project must be awarded to low bidder including the deduction for the “D” value if applicable.
- Post-award change orders to add Alternative Bidding by Pavement Type is not allowed.

Final Thoughts

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- Alternative bidding by pavement type is allowable if:
 - An Engineering and Economic analysis does not indicate a clear choice between essentially equivalent types.
 - Pavement costs are significant and will impact the low bid.
 - A Life-Cycle Cost Analysis is used to determine the cost difference between the pavement alternatives.
- An agency should give thought to how they are determining their pavement alternatives and LCCA.
- Be prepared to defend your decision to members of the public and the losing bidders.

Questions?

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Presentation available on-line at:

<https://doc.co/yzoQRU>

