

Product Summary

The highway industry is beginning to shift from using prescriptive specifications (those that dictate means and methods to achieve the desired outcome) to those that specify expected results, and leave the means and methods up to the contractor. This approach results in greater flexibility for a contractor, reduces oversight by owners, establishes more reliable facility performance, and is a more efficient use of each contractor’s unique strengths.

The R07 product provides information on the current state of performance specifications and introduces a series of model specifications for a broad range of highway elements (Hot Mix Asphalt [HMA] and Precast Concrete [PCC] Pavements, Bridge Decks, Earthwork Foundations, and Work Zone Traffic Control). The product also includes guidance for tailoring these specifications to particular projects or contracting method preferences; a management decision tool to identify appropriate uses of performance specifications; and a writers guide for developing specifications beyond the model specifications.

The following table summarizes the model specifications developed under R07 (and related SHRP2 research), and categorizes them into levels of readiness for adoption based on the availability of supporting technology.

Readiness for Use	Geotechnical	Work Zone	Pavements	Bridge Deck	General
1 (most)	<ul style="list-style-type: none"> • ProofRolling/ Mapping (using Intelligent Compaction (IC)) 	<ul style="list-style-type: none"> • Work Zone Traffic Control • Minimize construction duration • A+B for project • A+B1+B2+B3 (critical segments) 	<ul style="list-style-type: none"> • HMA Design-Bid-Build / Design-Build Tier 1 (durability parameters) • PCC Design-Bid-Build/ Design-Build Tier 1 (durability parameters) • PCC Modular Pavements 	<ul style="list-style-type: none"> • PCC Cast-in-Place Deck Design-Bid-Build/ Design-Build Tier 1 (durability parameters) 	<ul style="list-style-type: none"> • Quality Management Plan
2	<ul style="list-style-type: none"> • Subsurface Improvements for Existing Pavements 	<ul style="list-style-type: none"> • Public outreach • Messaging lead time • Public information strategies 	<ul style="list-style-type: none"> • HMA Short-term Warranty Tier 2 • PCC Short-term Warranty Tier 2 	<ul style="list-style-type: none"> • PCC Modular Precast Bridge Deck 	
3	<ul style="list-style-type: none"> • Earthwork/ Pavement Foundation Construction (using IC and other NDT) 	<ul style="list-style-type: none"> • Minimize delay through work zone • Travel time • Min speed • Max queue length 	<ul style="list-style-type: none"> • HMA Design-Bid-Build/Design-Build Tier 2 (use of NDT) • PCC Design-Bid-Build/Design-Build Tier 2 (use of NDT) 	<ul style="list-style-type: none"> • PCC Cast-in-Place Deck Design-Bid-Build/ Design-Build Tier 2 (using NDT) 	
4	<ul style="list-style-type: none"> • Ground Improvement using Vertical Support Elements 	<ul style="list-style-type: none"> • Minimize ambient impacts • Light • Noise 	<ul style="list-style-type: none"> • Design-Build-Operate-Maintain Pavement Performance Specification 	<ul style="list-style-type: none"> • PCC Cast-in-Place Deck Design-Bid-Build/ Design-Build Tier 3 and other bridge components (health monitoring) 	
5 (least)			<ul style="list-style-type: none"> • HMA Design-Bid-Build/ Design-Build Tier 3 (mechanistic models) • PCC Design-Bid-build/Design-Build Tier 3 (mechanistic models) 		

Notes: Tiers apply to pavements and bridge products

Tier 1 = Improved performance parameters and measurement practices

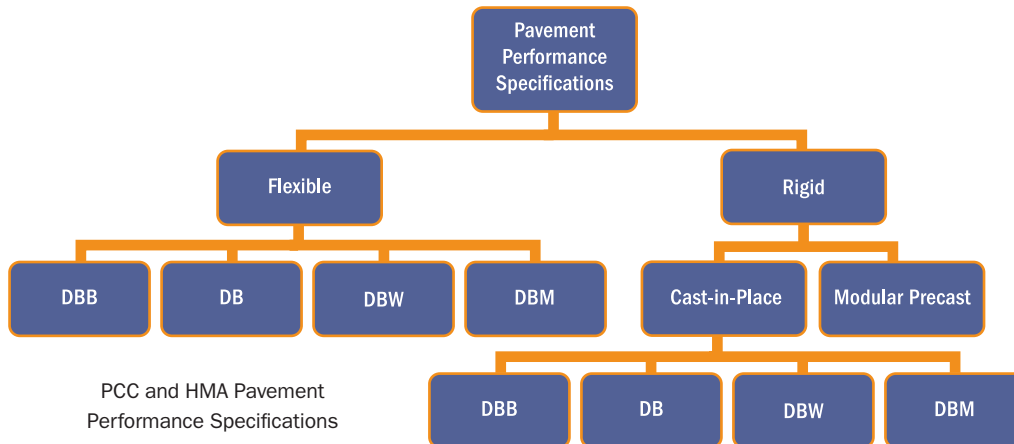
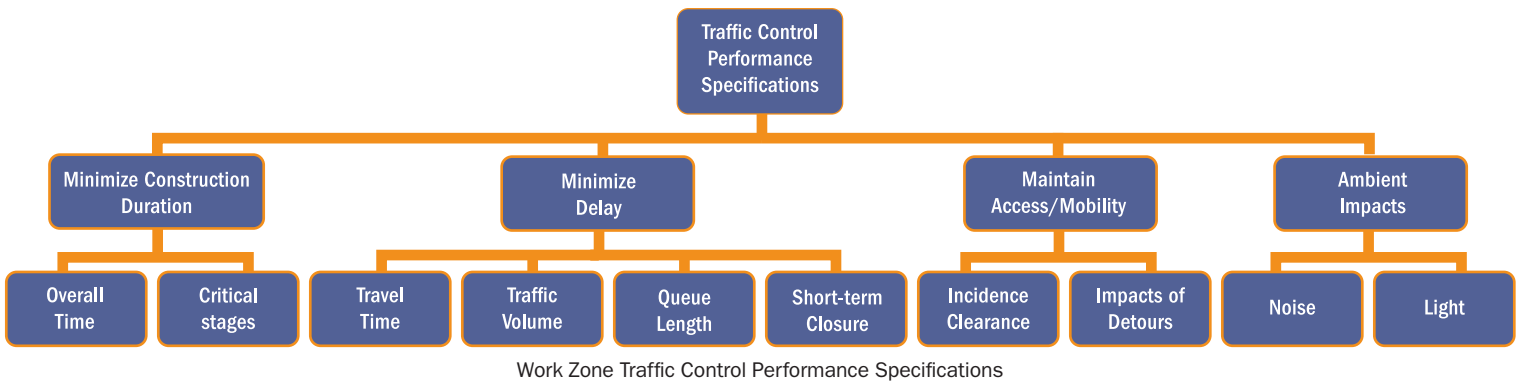
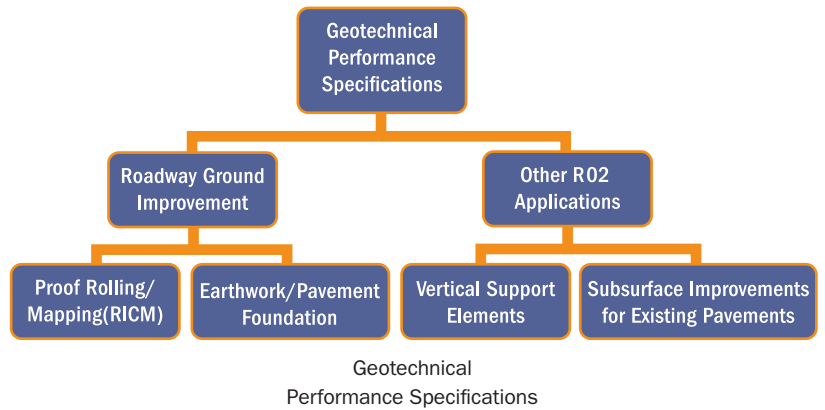
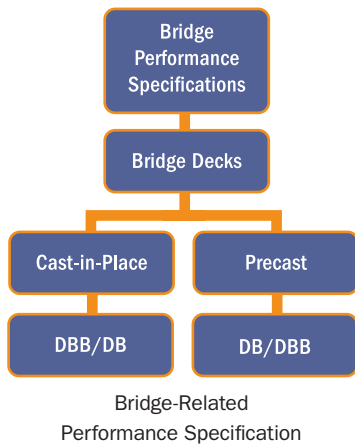
Tier 2 = Incorporating innovative non-destructive technology (NDT) performance measures

Tier 3 = Performance based on mechanistic empirical design models, and bridge health monitoring technology

Each specification can be adapted to traditional design/bid/build projects, design/build contracting, design/build/warranty, and design/build/operate and maintain strategies, depending upon the agencies comfort level with each approach.

Many of these specifications have been tried as demonstration projects and are ready for implementation in the short term. Others rely on further development of promising emerging technology to fully realize the benefit of adopting such an approach. The range of implementation readiness has been described in Tiers: Tier 1 being ready for immediate implementation; Tier 2 representing approaches that require use of innovative NDT technology that is not widely available; and Tier 3 which relies on further development of mechanistic-empirical design models to identify material characteristics that more accurately predict long-term performance and their target values.

The figures below describe the various families of model specifications and their expected application in any of the four basic contracting approaches.



For more information about SHRP2 Solutions, visit: www.fhwa.dot.gov/GoSHRP2