Asphalt Value Proposition:

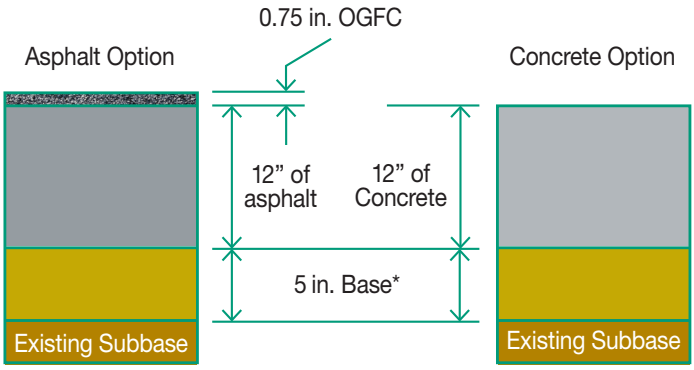
Speed of Construction

Quantifying Construction Costs

With the option of nighttime construction, and without the lengthy curing time typical of concrete (Poole, 2005), asphalt pavements offer the flexibility needed to handle all levels of traffic and can be constructed or maintained quickly with minimal disruption to travelers. In fact, new or newly rehabilitated asphalt pavement can be opened to traffic as soon as it has been compacted and cooled. There is no question of waiting for days or weeks, with traffic being detoured or squeezed. Simply put, the fastest choice in pavement construction is asphalt.

The interchange of I-10, I-12, and I-59 east in Slidell, Louisiana, northeast of New Orleans and constructed in 2016, presents a very compelling case for asphalt's speed of construction when rehabilitating a roadway. Each of these interstate roadways is a critical storm evacuation route that must be opened within 48 hours of a tropical storm entering the Gulf of Mexico during hurricane season. Speed of construction was of the utmost importance for this project due to lateral confinement prohibiting the placement of barricades in the work zone. The mainline roadways of all three interstate highways and six ramps were impacted by this project and the Louisiana Department of Transportation and Development's (LADOTD) primary traffic control concern was to avoid lane closures during peak travel hours. A list of lane closure restrictions required contractors to complete work on time, including restrictions on weekdays and weekends when no lane closures are allowed for certain segments, and others in which single lane closures are allowed. Concurrent lane closures on adjacent sections are allowed only in instances where traffic control dictates the prevention of hazardous yield conditions.

Both a concrete and an asphalt pavement section were designed by LADOTD. The alternative structural designs for the pavement are shown in Figure 1. Both of the LADOTD alternatives were remove and replace options.



*Base may be either unstabilized granular, cement stabilized, or asphalt stabilized

Figure 1. Design Alternatives for Louisiana Interchange (Lambert & Savoie, 2012).

> **The proposed time to construct for the asphalt bid was almost half (56%) that of the shortest concrete project (360 days versus 675 days), equating to a time cost savings of $4.2 million.**

The LADOTD published the "Apparent Bid Results" for this project in January 2015. The agency had estimated construction cost of approximately $40,757,000 with 700 days as the maximum construction time and a calculated user delay cost of $15,000 per day. The time cost for each of the five bids is presented in Table 1. Note that the second lowest overall bidder had the lowest construction cost but about 1.9 times the construction time – this made the difference between the two bidders. All the concrete bids had construction times between 640 and 700 days, resulting in about $10,000,000 in user delay costs, almost double that of the asphalt alternative. The proposed time to construct for the asphalt bid was almost half (56%) that of the shortest concrete project (360 days versus 675 days), equating to a time cost savings of $4.2 million.

Rank	Construction Bid, $	Proposed Time, days	Time Cost, $	Total Bid, $
1 (asphalt)	39,888,687	360	5,400,000	45,288,687
2 (concrete)	37,473,810	675	10,125,000	47,598,810
3 (asphalt)	47,524,942	699	10,485,000	58,009,942
4 (concrete)	53,532,280	640	9,600,000	63,132,280
5 (concrete)	59,918,761	700	10,500,000	70,418,761

Table 1. Comparison of Bids for Louisiana Interchange.

Barriere Construction Co. LLC performs both asphalt and concrete pavement construction in Louisiana. Their choice of bidding the asphalt alternative was based on the flexibility and speed of construction that asphalt offers. Furthermore, asphalt allowed the construction in the critical "fast" zones to take place quickly, allowing the remaining construction to take place behind hard barriers, making the work zone safer for motorists and workers. When asked why the asphalt alternative was bid at a lower work time than the concrete alternatives, Barriere representatives speculated that constructability issues associated with the size of concrete paving operations requiring more space and the timing of construction activities to account for such factors as curing may have played a critical role.

By quantifying the impacts of time costs on the local community, state agencies can gain a more holistic view of the total economic impact of a construction project. This analysis helps the agency make an informed decision surrounding the economic and construction costs associated with large pavement projects.

Recommendations:

1. Owners should quantify the time costs of construction operations during the pavement type selection process or lowest responsive bidder analysis.
2. Owners should consider pavement type selection for work zone safety impacts in critical "fast" zones.

NATIONAL ASPHALT PAVEMENT ASSOCIATION

888.468.6499 | AsphaltPavement.org

Poole, T.S. (2005). *Guide for Curing of Portland Cement Concrete Pavements.* Report FHWA-RD-02-099. Federal Highway Administration, McLean, Virginia.

Lambert, J.R., and R. Savoie (March 20, 2012) S.P. NO. H.003107, F.A.P. NO. H003107, French Branch Bridge – West Pearl River Bridge, St. Tammany Parish, Routes I-10, I-12, & I-59. Letter to Mr. Hector Santiago, P.E. Federal Highway Administration, Baton Rouge, LA.