ABC Innovative Projects

I-5 / South 38 th Street Diridge Location South 38 th Street over I-5 in the city of Tacoma in Pierce County State Washington Owner State Year ABC Built 2001 State ID # 5/430 NBI # 0015935A000000 Coordinates Latitude: 47.223333 Longitude: Contact Person Jugesh Kapur, P.E. State Bidge and Structures Engineer Washington State Department of Transportation Phone: 360-705-7207 Email: Kapurju@ Woold.wa.gov Conventional: Mobility Impact ABC: Time ABC: Partial-depth deck panels placed within one week with limited inghttime I-5 lane closures Conventional: Additional weeks of I-5 lane closures for full-depth CIP ideck ideck Impact Tier 1 Tier 2 Tier 3 Category - - X Primary - reduced traffic impacts - Driver(s) - reduced onsite construction time - - improved dife-cycle cost - - 0									
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Time within one week with limited nighttime 1-5 lane closures closures for full-depth CIP deck Impact Category Tier 1 Tier 2 Tier 3 Tier 4 Tier 5 Primary Driver(s) • reduced traffic impacts • reduced onsite construction time • improved work-zone safety • improved site constructability • improved site constructability • improved material quality and product durability • minimized environmental impacts • reduced life-cycle cost • approximation and 106-ft-wide two-span prestressed trapezoidal tub girder bridge (160.75 ft -164.25 ft) Description • 325-ft-long and 106-ft-wide two-span prestressed trapezoidal tub girder bridge (160.75 ft -164.25 ft) • Urban location • Average Daily Traffic count: 248,000 on I-5 (2010-year) • Traffic management alternative, if constructed conventionally: extended use of lane closures Existing Bridge: The existing four-span bridge was replaced to add capacity near a high-traffic-volume shopping mall interchange. Replacement Bridge: The replacement Bridge has 11.8-ft-wide traffic lanes and 11.8-ft-wide shoulders. The cross-section consists of 10.3-ft-wide 5.8-ft-deep precast post-tensioned open-top trapezoidal beams spaced at 18 ft with an 8-inch-thick composite deck consisting of 3.5 inch-thick partial-depth deck panels and 4.5-inch-thick cast-in-place concrete topping. The substructures were conventional concrete columns founded on spread footings.	Contact Person	State Bridg Washingto Phone: 36	ge and on State 0-705-7	Structures Engine Department of T 7207		tation			
Category x Primary Driver(s) • reduced traffic impacts • reduced onsite construction time • improved work-zone safety • improved site constructability • improved material quality and product durability • improved material quality and product durability • minimized environmental impacts • reduced life-cycle cost Description • 325-ft-long and 106-ft-wide two-span prestressed trapezoidal tub girder bridge (160.75 ft -164.25 ft) Urban location • Average Daily Traffic count: 248,000 on I-5 (2010-year) • Traffic management alternative, if constructed conventionally: extended use of lane closures Existing Bridge: The existing four-span bridge was replaced to add capacity near a high-traffic-volume shopping mall interchange. Replacement Bridge: The replacement bridge has 11.8-ft-wide traffic lanes and 11.8-ft-wide shoulders. The cross-section consists of 10.3-ft-wide 5.8-ft-deep precast post-tensioned open-top trapezoidal beams spaced at 18 ft with an 8-inch-thick composite deck consisting of 3.5 inch-thick partial-depth deck panels and 4.5-inch-thick cast-in-place concrete topping. The substructures were conventional concrete columns founded on spread footings. Construction Methods:		with	in one	week with limited		Convent	ional:	closures for	
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To reduce construction time and minimize traffic disruption, the Washington State Department of Transportation chose partial-depth precast stay-in-place deck panels in	Description	(160.75 • Urban lo • Average • Traffic n closures Existing E The existin shopping n Replacem The replac cross-secti trapezoida inch-thick p The substr Construct To reduce	ft -164 bcation a Daily hanage and four- nall inter tion con l beam partial- cuctures tion Me constru	.25 ft) Traffic count: 248 ement alternative, span bridge was erchange. bridge has 11.8-f isists of 10.3-ft-wi s spaced at 18 ft depth deck panels s were conventior ethods: uction time and m	,000 on if constr replaced t-wide tr de 5.8-ft with an s and 4. nal conc inimize	I-5 (2010- ructed con d to add ca affic lanes t-deep pre 8-inch-thic 5-inch-thic rete colum	year) ventio apacity and 1 cast po- k com k cast ins fou	nally: exter nally: exter near a hig 1.8-ft-wide ost-tension posite deck -in-place co inded on sp , the Washi	hded use of lane h-traffic-volume shoulders. The ed open-top consisting of 3.5- oncrete topping. oread footings.

Funding	Federal only	State only		Federal and State	Other		
Costs	The engineer's estimative (\$605,000 = 16% lower bridge was \$92 compared bridge	r than the enginee	er's e	estimate). The cost p	er square foot of		
	Partial-depth precast deck panels	•	•				
Solutions	Elements	Systems		Miscellaneous	•		
Structural	Prefabricat	ed Bridge Element	ts & :	Systems	Construction		
Solutions	•			•			
Geotechnical	Foundation	ns & Walls		Rapid E	Embankment		
Planning	•	•		Design-bid-build	 Full lane closure Incentive / disincentive clause 		
Project	Decision-Making Tools	Site Procureme	ent	Project Delivery	Contracting		
Photos Additional photos			MAN /				
High Performance Materials	•		71				
		louble and triple la	ane c	es on northbound ma closures on southbou y contractor and WS	Ind mainline SR 5		
	The contract allowed a temporary closures, wa traffic by midnight, Sep clause, the contract ind lanes of traffic on the b closures beyond the so 15 minutes prorated to • \$50 to \$300 for eac	as to begin Janua otember 15. In add cluded a disincent oridge and ramp b cheduled opening the nearest five r ch ramp	ry 3, ditior ive c y 12 time ninut	and the bridge was to the standard liqu of \$8,000 per day for :01 am, September e, liquidated damage tes as follows:	to be re-opened to idated damages failure to open all 15. In addition for s were assessed per		
	segments. The partial-	he 3-ft-wide transv k, were cast with p depth precast dec was placed below	verse partia ck pa v the	e closure joints betwe al-height intermediat anels were then erec panels to provide co	een segments, e diaphragms between ted and adjusted with ontinuous support. The		
	the design of this repla girder bridge uses pred conventional deck form were used to adjust ca 766 panels were place	cast tub girder seg ns, lane closures o mber on the 3.5-ii	gmer on I-4 nch-1	nts. With no need to 5 were greatly reduc thick precast pretens	construct and remove ed. Leveling screws ioned panels, and all		

		Х					
Incentive	Highways for LIFE		IBRD	SHRP2		SHRP2	Other
Program (\$)							
Contract Plans	Complete Set:	As	-built Plans (link to pdf)	AB	C *:		
Specifications	•		endments & Special	AB	C *:		
Bid Tabs	Not available.						
Schedule	Engineer's:	lot av	vailable.		Actu	ıal:	
Other Related Information			Manual for PBES Deta				
Photo Credits	Washington State Department of Transportation						

* Specific to the ABC used in the project.