

# Construction Manager General Contractor (CMGC) Delivery Method Overview

Presented by  
Saad Samani  
Division of Design



# Agenda

- Background
- Delivery Process
- Challenges
- California Infrastructure Delivery Coalition (CALINFRA) Prospective
- Benefits
- Program Awards



# Legislation

- Assembly Bill 2498 (Gordon)-2012
- Assembly 2126-2016
- Assembly Bill 114-2017
- Senate Bill 1262 (Beall)-2018



# What is a CMGC

**PRE-CONSTRUCTION**

Construction  
Manager

**Professional Services**

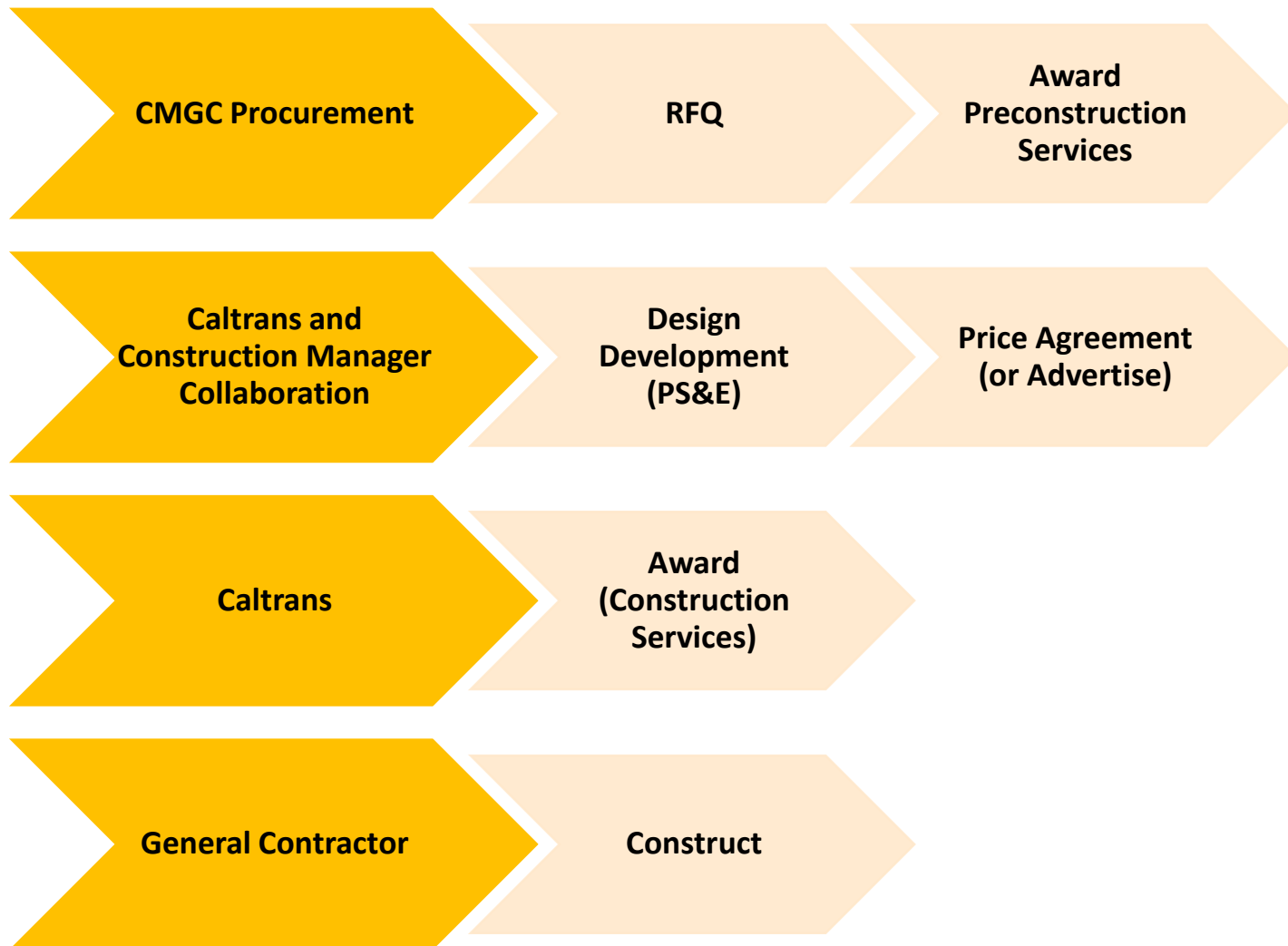
**CONSTRUCTION**

General  
Contractor

**Construction Services**

Price Agreement

# CMGC Lifecycle



# CMGC Element of Success

## Project Nomination Process



- District: Prepares Nomination Fact Sheet
- Expert Panel: Review Nomination Fact Sheet
- Alternative Delivery Committee: Review and Vote
- Recommendation to Chief Engineer

# CMGC Element of Success

## Project Nomination Criteria



- Complex projects
- Environmental challenges
- Multiple third-party approval
- Short construction windows
- Challenging traffic staging

# CMGC Elements of Success-continued



## Specialized Experience

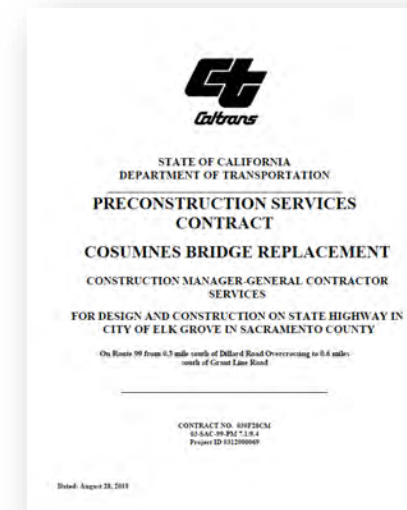


STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

### REQUEST FOR QUALIFICATIONS

### SR 70 BINNEY JUNCTION ROADWAY REHABILITATION AND COMPLETE STREETS

CONSTRUCTION MANAGER/GENERAL  
CONTRACTOR SERVICES





# CMGC Elements of Success-continued

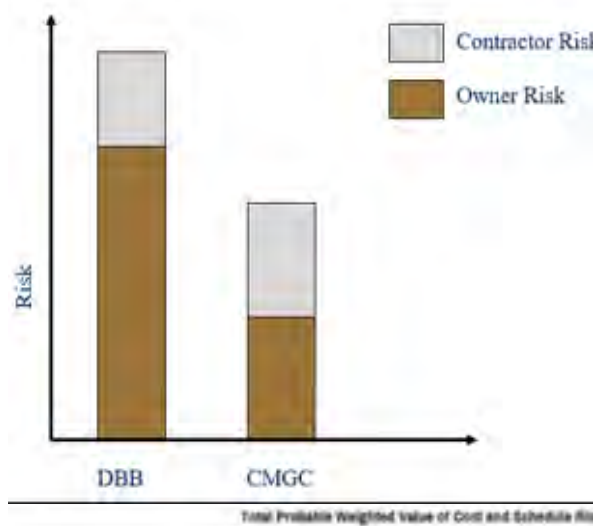
## Early Partnering



# CMGC Elements of Success-continued

## Contractability and Risk Resolution

Risk Identification		Evaluation Before Mitigation							Overall Risk Profile		Initial Mitigation Strategies	
Type	Risk	Constraint, Cause or Threat	Risk Type	Priority and Severity of Impact	Probability	Construction Costs	Development Costs	Development Schedule (days)	Construction Schedule (days)	Risk Before Mitigation		Risk After Mitigation
Operational	Delays to construction due to limited access to production areas	Congested and heavily avoided corridor	Cost-Schedule	Risk Priority	●	\$10,000,000	\$0	0	30	●	●	Early for MGT and resources, skip start of Segments A, B and C.
	OPWV encroachment permits are delayed and/or require significant RFI logging	OPWV is tight against the corridor to heavy facilities	Cost-Schedule	Risk Priority	●	\$1,000,000	\$1,000,000	30	10	●	●	Investigate RFI proactive plans to speed CIM system, leverage joint engineering with OPWV systems, engage early and often
	Construction back up during construction and access to workables at underpassways and tracks, variables costs and schedule duration	Congested and heavily traveled corridor and strategic assets	Cost-Schedule	Risk Priority	●	\$8,500,000	\$0	0	100	●	●	Utilize temporary bridges for road traffic, utilize truckings and permit-temp works of work openings for full median access and use of C-rows to reinforce que positions
Design	Inconsistent use of CT design standards and details between segments	Multiple Design Teams	Design-Schedule	Risk Priority	●	\$500,000	\$1,000,000	40	0	●	●	Office a central team of design resources that oversee the application to each element, establish coordination meetings, utilize one set of details for the project
	CLM&C process requires late stage releases of cost coverage - possible schedule delay	Design Drawing with subsequent updates/Minor issues	Design-Schedule	Risk Priority	●	\$1,000,000	\$1,000,000	30	0	●	●	Identify areas in Segments B, D, and E that could have potential for CLM&C
				Risk Priority	●	\$1,000,000	\$500,000	40	20	●	●	Early working groups to engage stakeholders, identify release low cost solutions to achieve desired architectural and environmental vision
Operational				Risk Priority	●	\$1,000,000	\$1,000,000	30	20	●	●	Model temporary storage needs to maintain storage continuity between stages as existing facilities are removed. Account for final rail and storm treatment options.
				Risk Priority	●	\$0	\$4,000,000	30	30	●	●	Unify slip formed C-10 Gravity shaft and/or permit retaining walls able to minimize RFI acquisition and TCE
				Risk Priority	●	\$2,500,000	\$1,000,000	30	120	●	●	Office a Multiple Agency Forum (MAF) to present overlapping requirements, review documents early and address issues ahead of permit application
Operational				Risk Priority	●	\$100,000	\$200,000	30	30	●	●	Office a Multiple Agency Forum (MAF) to present overlapping requirements, review documents early and address issues ahead of permit application
				Risk Priority	●	\$1,000,000	\$1,000,000	30	30	●	●	Align start of segments A, B and C, utilize C&S contracts, and multi-segment traffic and 3D modeling
				Risk Priority	●	\$5,000,000	\$0	0	0	●	●	Develop initial subcontracting plan with intentions and early contract to O&M. Engage Caltrans in selecting bids and balancing subcontracting vs. self perform max.
Operational				Risk Priority	●	\$1,000,000	\$0	0	0	●	●	Create utility corridors and allow EWS for relocation, accurate segment B to align with segment A & C to allow longitudinal stream to be relocated for efficiency
				Risk Priority	●	\$1,000,000	\$200,000	30	30	●	●	Over \$20M in probable cost mitigated and nearly a year in schedule risk mitigated



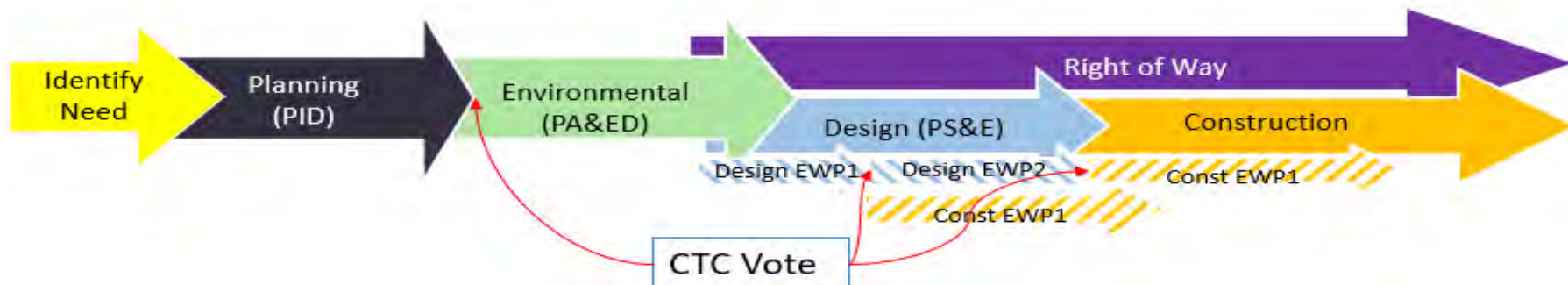
\$28,240,000      744

# CMGC Elements of Success-continued

## Early Work Packages

Commonly used for:

- Securing long lead material
- Utility Relocation
- Independent Part
- Streamline Delivery



# CMGC Elements of Success-continued

## Construction Price Check



Project Name: Highway 101: Carpinteria to Santa Barbara Project - Segment 4D North (San  
 Preconstruction Services Contract No.: 05-0N70CM  
 Construction Contract No.: 05-  
 Estimate Name: OPCC3 - 100%- Read 5 - No RR Cert.

		Partial Plug Items			CM'S ESTIMATE			
		Full Plug Items			UNIT PRICE	UNIT PRICE W/	TOTAL COST	CM/ICE Δ%
		New Items in Red - Deleted Items	Agreed Quantity		OPPC3	MARKUP	OPPC3	OPPC3
Bid No	Item Code	Description	Units	Quantity				
1	70030	LEAD COMPLIANCE PLAN	LS	1	\$ 3,590.00	\$ 3,957.98	\$ 3,590.00	
2	80060	LEVEL 2 CRITICAL PATH METHOD SCHEDULE	LS	1	\$ 1,526.00	\$ 1,682.42	\$ 1,526.00	
3	90100	TIME-RELATED OVERHEAD (W/DAY)	W/DAY	580	\$ 2,096.19	\$ 2,311.06	\$ 1,215,792.38	
4	90205	DISPUTE RESOLUTION BOARD ON-SITE MEETING	EA	11	\$ 3,000.00	\$ 6,000.00	\$ 33,000.00	
5	90210	HOURLY OFF-SITE DISPUTE-RESOLUTION-BOARD-RELATED	HR	33	\$ 125.00	\$ 250.00	\$ 4,125.00	
6	120090	CONSTRUCTION AREA SIGNS	LS	1	\$ 123,500.00	\$ 136,158.75	\$ 123,500.00	
7	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 689,203.58	\$ 759,846.95	\$ 689,203.58	
8	120101	TRAFFIC CONTROL SUPERVISOR	DAY	580	\$ 237.61	\$ 261.96	\$ 137,811.27	
9	120120	TYPE III BARRICADE	EA	9	\$ 65.00	\$ 71.66	\$ 585.00	
10	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	139,000	\$ 0.54	\$ 0.59	\$ 74,500.00	
11	120165	CHANNELIZER (SURFACE MOUNTED)	EA	1,200	\$ 53.00	\$ 56.43	\$ 63,600.00	
12	120204	PORTABLE RADAR SPEED FEEDBACK SIGN SYSTEM DAY	EA	580	\$ 47.16	\$ 51.99	\$ 27,352.39	
13	120300	TEMPORARY PAVEMENT MARKER	EA	1,950	\$ 7.50	\$ 8.27	\$ 14,625.00	
14	128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	LS	1	\$ 62,131.47	\$ 68,499.95	\$ 62,131.47	
15	128654	TEMPORARY AUTOMATED END OF QUEUE WARNING SYST	EA	580	\$ -	\$ -	\$ -	
16	128658	END OF QUEUE MONITORING AND WARNING WITH TRUC	EA	30	\$ 752.00	\$ 829.08	\$ 22,560.00	
17	129000	TEMPORARY RAILING (TYPE K)	LF	72,400	\$ 14.78	\$ 16.30	\$ 1,070,150.30	
18	14105	ALTERNATIVE TEMPORARY CRASH CUSHION - TL-3	EA	58	\$ 4,211.00	\$ 4,642.63	\$ 244,237.88	
19	129100	TEMPORARY CRASH CUSHION MODULE	EA	2	\$ 7,792.76	\$ 8,591.52	\$ 15,585.52	
20	129152	TEMPORARY RADAR SPEED FEEDBACK SIGN SYSTEM	EA	4	\$ 3,279.18	\$ 3,615.30	\$ 13,116.73	
21	130100	JOB SITE MANAGEMENT	LS	1	\$ 114,738.28	\$ 126,498.95	\$ 114,738.28	
22	130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	1	\$ 3,270.00	\$ 3,605.18	\$ 3,270.00	
23	130310	RAIN EVENT ACTION PLAN	EA	15	\$ 436.00	\$ 500.00	\$ 6,540.00	

# Programming/Allocation

- Programming Identification
- Amend Programming
- Allocation Flexibility



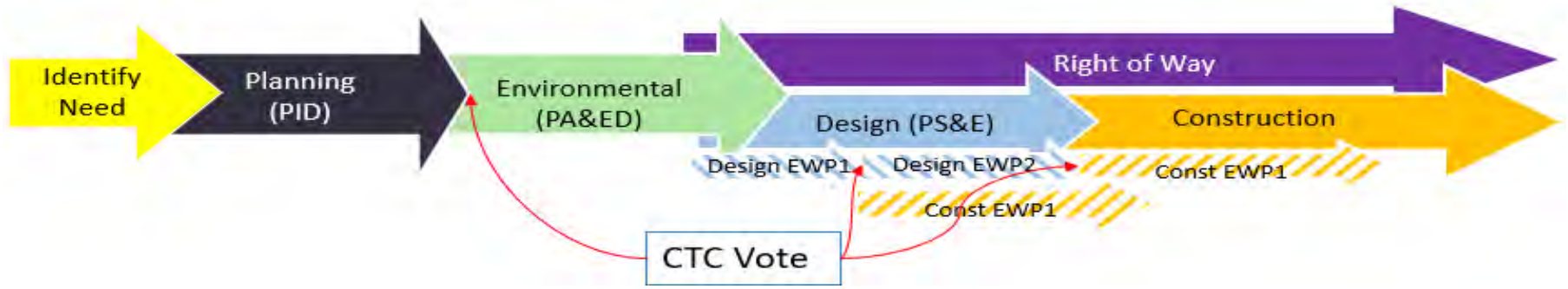
**CTC Financial Vote List**

May 16-17, 2024

**2.5 Highway Financial Matters**

Project No. Allocation Amount Recipient RTPA/CTC County Dist-Co-Rte Postmile	Project Title Location Project Description Project Support Expenditures	PPNO Program/Year Phase Prgm'd Amount Project ID Adv Phase EA	Budget Year Item # Fund Type Program Code	Amount by Fund Type
--	--	---	---	------------------------

2.5s.(5) State-Administered Multi-Funded SB 1 SSCP/SB 1 LPP (Formulaic) Project On Resolution SSCP-A-2324-07



# CMGC Major Challenges

- Fairly new concept
- Estimate reconciliation
- Support costs
- Misconception





# Industry Perspectives on CMGC



Presented by:

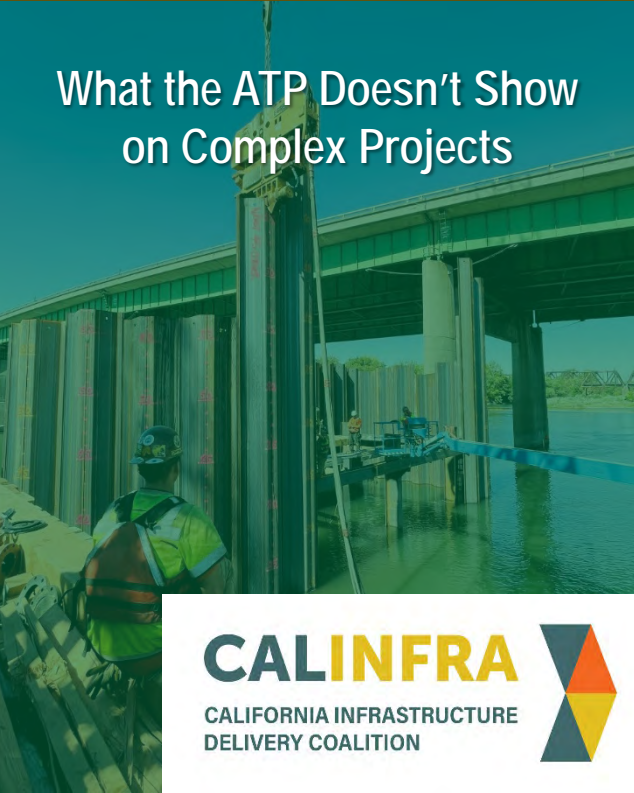


Transformation. Innovation. Inspiration.



# CMGC Benefits on Complex Work

## What the ATP Doesn't Show on Complex Projects



**CALINFRA**  
CALIFORNIA INFRASTRUCTURE  
DELIVERY COALITION



### Innovation



#### Constructability Reviews:

Lowers Final Cost  
Speeds Delivery  
Optimizes Staging  
Reduces Risk Avoids Long Lead Material Matches Permits to Means  
Leverages the Knowledge & Experience of the Team (Caltrans, CMGC, ICE)

### Risk Mitigation



#### Identification and Quantification:

Forms Plans to Eliminate & Mitigate Risk in Preconstruction  
(Both Caltrans Risk and Construction Risk)  
Creates Plans in Preconstruction to Mangle Risk in Construction  
Eliminates Cost & Schedule Claims Eliminates or Reduces Change Orders

### Cost and Schedule Certainty



#### Cost & Schedule Validated 3-ways & 3-times:

Third Party Bottom-Up Estimate & Schedule Validation (ICE)  
Engineers Estimate Based on Contract Cost Data  
(Sometimes May Not be Applicable to Complex Projects)  
CMGC Bottom-Up Estimate & Schedule  
Risks for Cost and Schedule are Incorporated into ATP

**GRANITE**



**FLATIRON**







**CALINFRA**  
CALIFORNIA INFRASTRUCTURE  
DELIVERY COALITION

Does  
Lowest Bid  
Mean Lowest  
Cost



# Comparing CMGC to DBB for Total Cost of Delivery

DART Summary Tracking Sheet			
Summary			
DART No.	Item Description	Realized savings in GMP	Projected ROW savings
Total Innovation Savings (SR99 Project)		(\$35,256,380.95)	(\$7,082,178.00)
		Construction Cost	ROW Cost

**\$42M in scope and R/W savings on SR99**



	Original Allocation	AUP/Original Contract Value	Change Orders	Claims	Final Costs	
Construction Management General Contractor (CMGC) Projects	SR-99 Realignment Project (Construction Only)	\$158,780,000	\$154,238,833	\$7,404,663	\$0	\$161,909,250
	Early Work Package (06-2HT114)	\$29,000,000	\$26,587,424	\$2,016,033	-	\$28,372,278
	Parent Package (06-2HT104)	\$129,780,000	\$127,651,409	\$5,388,630	-	\$133,536,972
	Cosumnes Bridge Replacement Project (Construction Only)	\$164,838,300	\$149,515,287	\$8,325,061	\$0	\$158,410,740
	Early Work Package CP6 (03-0F2864)	\$67,657,900	\$62,554,557	\$3,780,689	-	\$65,716,371
	Early Work Package CP5 (03-0F2854)	\$10,578,000	\$9,279,791	\$261,949	-	\$9,178,975
	Early Work Package CP4 (03-0F2844)	\$19,030,300	\$16,311,046	\$1,206,732	-	\$17,503,717
	Early Work Package CP3 (03-0F2834)	\$1,655,000	\$1,541,834	\$20,570	-	\$1,565,085
	Early Work Package CP2 (03-0F2823)	\$3,457,000	\$2,919,312	\$286,826	-	\$3,164,608
	Early Work Package CP1 (03-0F2814)	\$11,087,000	\$9,389,234	\$1,230,980	-	\$10,373,880
Parent Package (03-0F2804)	\$51,373,100	\$47,519,513	\$1,537,315	-	\$50,908,104	
DBB Projects	I-5 Pavement Rehabilitation (03-0F5904)	\$72,399,000	\$58,639,586	\$4,995,531	\$0	\$61,397,568
	1-80 Across the Top (03-3797U4)	\$104,588,000	\$88,422,860	\$25,807,571	\$9,400,000	\$122,278,667

## VALUE TO CALTRANS

- Transparency and competitive pricing
- Maximum innovation opportunities
- Comprehensive Risk Management Strategy



# Case Studies

What the ATP Doesn't Show on Complex Projects



## Complex Project:

Multiple Funding Sources and Oversight by CHSR and Caltrans  
Built Along Existing UPRR Yard & Crossings of UPRR  
Significant Long-Lead Utility Relocations and Conflicts  
Highly Complex Staging Complex ROW Acquisitions



## Preconstruction Innovation:

Staged Construction to Coincide with ROW Acquisition **Saving \$2.5M**  
Developed a Slip-Formed Gravity Wall **Saving \$2.66M**  
Restaging of Project **Saving \$4.6M** Optimized CRCP Tie-ins **Saving \$2.3M**  
Preconstruction Coordination with UPRR & AT&T **Saving \$6.11M**



## Risk Avoidance and Mitigation:

Mitigated Production and Delay Impacts from UPRR  
Eliminated Impacts from ROW Acquisition and Challenges  
Eliminated CHSR Funding Delay Impacts  
Eliminated over 12 months of AT&T Relocation Delays



## Cost & Schedule Benefits & Certainty: (Budget for Risks Were Established with ATP) Delivered Ahead of Schedule

All Change Orders Were Related to Scope Additions and Betterments  
Interchange Construction Was Reduced from 18 Months to 6 Months in Preconstruction  
Adjustments to Staging and Tie-ins During Preconstruction Saved Over 80 Calendar Days  
The Construction Support Savings and ROW Savings is NOT Reflected in Final Costs



# Case Studies

What the ATP Doesn't Show on Complex Projects

Consumnes River Bridge Replacements



## Complex Project:

Complex Permitting and Environmental Constraints  
Highly Complex Staging of a Major Freight Corridor with Phased Construction  
Anticipated Relocation of a Major SMUD 245kV Transmission Line and Towers  
A ½ Mile of Bridge Construction Over an Uncontrolled Flood Plain and River



## Preconstruction Innovation:

Saved Over **\$33 M** in Construction Costs During Preconstruction  
Reduced Staging from **3 Phases over 3 years to 2 Phase over 2 years**  
Reduced a 3-Span Bridge over UPRR to a Single Span Bridge  
Partnership On Permitting Delivered the Impossible in Record Time



## Risk Avoidance and Mitigation:

Mitigated Permitting Delays  
Reduced Mitigation and Impacts to the Threatened and Endangered Species  
Early Engagement of UPRR Mitigated Construction and Design Risk  
Alternative Staging Avoided **18+ Months** In Transmission Line Relocation



## Cost & Schedule Benefits & Certainty: (Budget for Risks Were Established with ATP)

Delivered Two Years Ahead of Schedule  
All Change Orders In EWS were transfers of Parent Project Scope to EWS, Total CO's <1%  
Cost Avoided in Relocations of the 245 kV Transmission Line is NOT Reflected in the ATP  
The Cost Avoided In Railroad Flagging Time is NOT Reflected in the ATP or Final Costs  
The Construction Support Savings and ROW Savings is NOT Reflected in Final Costs

# CMGC Benefits Summary

- **Schedule optimization**



## Cosumnes River Bridge Replacement Project

	<b>Design Bid Build</b>	<b>CMGC</b>
Begin Construction	10/15/2020	9/16/2019
End Construction	11/1/2024	4/11/2023

- **Better Cost Certainty During Construction**
- **Assist with permits/3<sup>rd</sup> party approvals**
- **Quality Design**
- **Innovations**

# Project Awards

North Coast Corridor CMGC Project  
2023 ASCE Region 9 Outstanding Transportation Project



# Project Awards-continued

I-80/I-680/Route 12 Interchange CMGC Project  
2023 Solano County Transportation Authority Project of the Year



# Project Awards-continued

I-215 Barton Road Interchange Reconstruction- 2021 Honorable Mention Award by International Partnering Institute







**Thank you!**