

RISK REGISTER LEVEL	3	PROJECT NAME	SR4 Operational Improvement Project			DIST- EA	04-1J030K	PROJECT MANAGER	Laurie Lau	D4 RISK MANAGER	Patrick Treacy/Pradeep Narra		TOTAL COST (Capital +Support)	\$0.00								
PROJECT PHASE	PID	PDT MEMBERS	RISK ASSESSMENT										TOTAL DAYS (Construction + Initial review (30days)+ Closeout (60 days))	90								
Risk Identification					Probability		Cost Impact (\$)				Time Impact (days)				P1/P3	C/S	Rationale		Risk Response			
Status	ID #	Category	Title	Risk Statement	Current status/assumptions	Low	High	Low	Most likely	High	Probable	Low	Most likely	High	Probable			Strategy	Response Actions	Risk Owner	Updated	
Active	1	Design	Approval of Non-Standard Features	As a result of an inability to justify the merits of non-standard features, additional elements may have to be constructed, resulting in additional unanticipated construction and right of way costs.	Alternative 1 would not require significant Mandatory exceptions, however, as envisioned, Alternatives 2 and 3 would require lane width, median width, horizontal stopping sight distance, and shoulder width exceptions.	40	80	\$1,000,000	\$50,000,000	\$150,000,000	\$40,200,000	0	0	0	0	P1		Accept	Work with Design Coordinator to gain approval for non-standard features during PA/ED phase	CCTA	9/18/2015	
Active	2	Environmental	Environmental Permitting	Because the project spans areas within and outside of the East Contra Costa Habitat Conservation Plan (ECCHCP) area, differences in permitting costs and requirements may occur, resulting in unanticipated permitting costs and delay in obtaining the required permits.	Based upon precedent being set on the Kirker Pass widening project with similar location, within and outside of the ECCHCP, the HCP permit fees and processing are expected for the entirety of the project.	10	50	\$100,000	\$500,000	\$2,500,000	\$310,000	0	100	240	34	P1		Mitigate	Engage resource agencies, including HCP, California Department of Fish and Wildlife, US Fish and Wildlife Service and US Army Corps of Engineers early in the PA/ED process to identify the appropriate mitigation strategy	Caltrans Permitting	9/2/2015	
Active	3	Design	Positive Location of Utilities	Because the project proposes to defer the positive locating of the underground utility crossing to the PS&E phase, later potholing efforts may reveal that utilities require relocation, resulting in increased project cost and potential schedule delay	Preliminary utility mapping does not indicate significant utility relocation concerns. The proposed process is consistent with Caltrans standards and processes. Should any significant issues arise during PA/ED, potholing could be scheduled at that time to enable quantification of potential utility relocation impacts.	0	80	\$200,000	\$1,000,000	\$10,000,000	\$1,493,333	0	0	240	32	P1		Mitigate	Carefully monitor potential utility impacts during PA/ED. Establish early engagement protocols with utility companies should utility relocation needs arise	Project Engineer	9/2/2015	
Active	4	PM	Funding Availability	As a result of the current lack of identified funding coupled with the possibility that a planned sales tax measure in Contra Costa may not be successful, a significant funding gap for all project packages could occur, which would lead to an inability to fund any operational improvements.	Project approach anticipates that complete project funding will not likely materialize all at once. A successful sales tax reauthorization will provide some funding which can be coupled with other funding sources to enable construction of one or more packages.	20	50	\$20,000,000	\$100,000,000	\$250,000,000	\$43,166,667	0	0	0	0	P1		Accept	Funding availability risks are beyond the control of the project team. Project is structured to provide operational benefits for either small or large funding availability	CCTA/ Caltrans	9/2/2015	
Active	5	Environmental	Challenge to Environmental Documents	As a result of anticipated IS/MND and IS/EA CEQA/NEPA documents, potential lawsuits may challenge environmental reports for one or more packages, which would extend the project schedule and increase project delivery costs.	Project does not anticipate EIR/EIS for additional mixed flow capacity. It is possible that groups may challenge a lesser document and require an EIR/EIS for the mixed flow capacity enhancement packages.	25	75	\$500,000	\$2,500,000	\$10,000,000	\$2,166,667	150	350	500	167	P1		Mitigate	Environmental challenge would require EIR/EIS. The cost of preparation of these documents could range from 500k to upwards of \$10M. Additional schedule could range from 9mo to 2years.	CCTA/ Caltrans	1/28/2016	
Active	6	Environmental	Wetland or Waters of US	As a result of the presence of unanticipated wetland or Waters of US within footprint of project, additional permitting may be required, increasing project schedule and cost.	Project assumes some level of wetland features within the project limits. Additional features may be identified during PA/ED	25	75	\$50,000	\$100,000	\$2,000,000	\$358,333	0	60	220	47	P1		Accept	Presence is already anticipated. Additional presence is possible, but may not have significant cost or schedule impact	PDT	9/2/2015	
Active	7	Environmental	Coordination with the public agency that has jurisdiction over 4 (f) resources	As a result of unanticipated permanent or temporary project elements within Diablo Creek Golf Course and the Delta de Anza Regional Trail, an Individual Section 4 (f) approval may be required, increasing project duration and costs.	No temporary or permanent use of a Section 4(f) resource is expected. Once complete, the analysis will have to be reviewed by Caltrans Legal and the Caltrans Environmental Coordinator for District 4	0	25	\$50,000	\$250,000	\$2,000,000	\$95,833	0	0	240	10	P1		Avoid	Impacts to a 4 (f) resource are unlikely and can be avoided with design elements such as retaining wall or other refinements.	If 4 (f) impacts are identified, design to avoid them. If costs are extreme, engage 4 (f) property owner to identify acceptability of the impacts.	PDT	1/28/2016
Active	8	Environmental	Special-status species (or associated habitat)	Because the beds and banks of Walnut Creek, and Mt. Diablo Creek are potentially CDFW-regulated habitats, impacts to these creeks would likely result in impacts to jurisdictional waters, resulting in a determination that the project would affect biological resources and may increase project time and costs.	Project packages may have jurisdictional impacts would result in mitigation cost and schedule impacts.	25	75	\$100,000	\$1,000,000	\$2,000,000	\$516,667	120	160	240	87	P1		Avoid	Some impact is anticipated. Jurisdictional impacts will result in mitigation and schedule extension due to consultation and permitting requirements.	To the extent feasible, impacts to jurisdictional waters should be avoided by construction of walls or bridges and mitigate if unavoidable.	PDT	1/28/2016

RISK REGISTER LEVEL	3	PROJECT NAME	SR4 Operational Improvement Project			DIST- EA	04-1J030K	PROJECT MANAGER	Laurie Lau		D4 RISK MANAGER	Patrick Treacy/Pradeep Narra				TOTAL COST (Capital +Support)		\$0.00				
PROJECT PHASE	PID	PDT MEMBERS	RISK ASSESSMENT													TOTAL DAYS (Construction + Initial review (30days)+ Closeout (60 days))		90				
Risk Identification					Probability		Cost Impact (\$)				Time Impact (days)				P1/P3	C/S	Rationale	Risk Response				
Status	ID #	Category	Title	Risk Statement	Current status/assumptions	Low	High	Low	Most likely	High	Probable	Low	Most likely	High	Probable			Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	9	Design	Geotechnical	Due to the presence of unstable soil material at the Willow Pass cut, widening required for Alternative 1 could potentially impact the slide area, resulting in significant additional construction cost.	Project assumes widening could be accommodated with a reasonably standard wall system that accounts for the unstable material. Additional geotechnical investigation could trigger the need for more complex design solutions.	35	65	\$2,000,000	\$3,500,000	\$10,000,000	\$2,583,333	0	0	0	0	P1		There is a reasonable likelihood that widening would require more expensive wall types, such as tie-back walls or possible significant grading work to remove and reconstruct the slide areas.	Accept	If widening is required, the final design solution will be dictated by the field conditions. If Alternative 2 is possible, the issue may be avoided with a design exception.	Project Engineer/ Geotechnical Engineer	9/2/2015
Active	10	Construction	Paleontological resources	Due to excavations along the project, paleontological resources could potentially be encountered during construction. If unrecorded paleontological resources are discovered within the environmental study area, construction monitoring by a qualified paleontologist and a curation program may be required, resulting in increased project costs and schedule impacts during construction.	Project currently assumes that no significant paleontological resources will be encountered.	10	25	\$250,000	\$500,000	\$2,000,000	\$160,417	90	120	350	33	P3		Paleontological monitoring will result in construction in efficiency and monitoring costs.	Accept	Presence of resources will have to be identified in construction documents to avoid costly construction delay claims	Project Engineer/ Environmental Planner/ RE	9/2/2015
Active	11	Design	Interaction with Concord Naval Weapons Station	Due to acceleration or deceleration of the Concord Naval Weapon Station Development, offsite improvements required at Willow Pass Road and Port Chicago interchanges may need to be coupled with other mainline improvements, resulting in impacts to the scope, schedule, and cost of one or more project packages.	Alternatives 1,2 and 3 can accommodate the interchange modifications anticipated. While the inclusion of additional scope may cause some delay and additional coordination, it may also bring needed capital to kick start other improvements. While a threat, this risk also presents an opportunity.	50	75	\$100,000	\$500,000	\$3,000,000	\$750,000	100	180	240	108	P1		The additional cost to the project is only the costs of incorporating the additional design and coordination. It is likely that inclusion of significant additional scope would delay a project between 6mo and 1 year	Accept	Monitor progress of NWS reuse and continue close coordination with the City of Concord.	CCTA/ Caltrans	9/2/2015
Active	12	Construction	Hazardous Materials	Due to historic or natural occurring presence, hazardous materials could be encountered during Phase II soils sampling, which would increase project costs.	ADL, methane, and other contaminated materials are often encountered on highway widening projects. Recent construction in the 1990's likely eliminated most sources of contamination, but the risk is still present and should be monitored	5	50	\$1,000,000	\$1,500,000	\$6,000,000	\$779,167			0	0	P3		Presence of ADL or other contaminated materials will significantly increase the cost of excavation and disposal of hazardous waste. Likelihood is low due to recent past projects and widening.	Mitigate	Perform Phase II testing early during the design Phase and perform Phase I analysis during PA/ED	Envonmental Engineering	1/28/2016
Active	13	Construction	Cultural Resources	Due to excavations along the project, Native American and cultural resources could potentially be encountered during project construction, which would increase project costs and potentially delay project construction. In addition, uncertainty around implimention of AB 52 may add additional cost and delay risk.	If it is determined that there is a high potential for Native American cultural resources to be discovered within the environmental study area, monitoring for Native American artifacts during construction may be required.	5	50	\$100,000	\$250,000	\$5,000,000	\$490,417	20	60	180	24	P3		Additional project costs are likely isolated to excavation monitoring in sensitive areas. If significant artifacts are found, construction delay and inefficiencies for large excavations are likely to result in significant additional cost and time delay	Accept	Likelihood of archaeological artifacts is to be determined during PA/ED. Recent improvement projects did not encounter significant resources, therefore probability is considered low	Environmental/ Design/ RE	1/28/2016
Active	14	Design	Demonstration of Independent Utility and Logical Termini	Because final traffic analysis has not been performed at PID phase, some constructive packages may not be able to demonstrate independent utility and logical termini, requiring packages to be combined and increasing package construction cost.	Preliminary traffic analysis indicates independent utility and logical termini can be shown for all packages; however, more detailed traffic analysis will be performed during PA/ED	10	35	\$20,000,000	\$30,000,000	\$50,000,000	\$7,500,000	120	120	500	56	P1		Project packages will likely be constructed in sequence as described in the PSR-PDS, but the option exists to construct packages out of sequence. Some packages may struggle to show independent utility and logical termini if constructed out of sequence.	Accept	Traffic analysis during PA/ED will indicate if independent utility and logical termini can be demonstrated. If a package is likely to be constructed out of sequence, the operational benefit should be tested in a study, using the best available information, prior to committing significant resources to completion of traffic analysis if there is concern.	PDT	1/28/2016
Active	15	ROW	Longitudinal Encroachment Approval for Existing utilities	As a result of the presence of currently unknown longitudinal utility encroachments, gaining approval for the encroachments may be challenging, resulting in increased relocation cost or delays in gaining longitudinal exception approvals.	No longitudinal utilities are expected to be proposed within State ROW; however, the possibility always exists.	5	20	\$250,000	\$500,000	\$5,000,000	\$239,583	120	120	240	20	P1		Relocation of utilities will require time and cost. Costs and delays are best estimates for approval or relocation of as yet identified encroachments.	Accept	Begin consultation with Caltrans Design once any potential longitudinal utilities are identified. Gain concurrence on appropriate course of action during PA/ED.	ROW	1/28/2016

RISK REGISTER LEVEL	3	PROJECT NAME	SR4 Operational Improvement Project			DIST- EA	04-1J030K	PROJECT MANAGER	Laurie Lau		D4 RISK MANAGER	Patrick Treacy/Pradeep Narra				TOTAL COST (Capital +Support)			\$0.00			
PROJECT PHASE	PID	PDT MEMBERS	RISK ASSESSMENT													TOTAL DAYS (Construction + Initial review (30days)+ Closeout (60 days))		90				
Risk Identification					Probability		Cost Impact (\$)				Time Impact (days)				P1/P3	C/S	Rationale	Risk Response				
Status	ID #	Category	Title	Risk Statement	Current status/assumptions	Low	High	Low	Most likely	High	Probable	Low	Most likely	High	Probable			Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	16	Environmental	Delay in Technical Studies during PA&ED	Due to potential impacts identified during PA/ED scoping or during PA/ED process, previously unanticipated tasks may be required in PA&ED phase, resulting in additional time and cost to gain project approval and environmental clearance.	PEAR documentation is well considered and scoping of PA/ED phase should prove to be appropriated. Unanticipated resources or impacts are always possible.	25	75	\$20,000	\$100,000	\$500,000	\$103,333	90	180	240	85	P1		Additional environmental studies always have issues. Depending upon the type of unforeseen study, the study costs and timing are variable.	Accept	Full scope of environmental studies will be identified during scoping and prosecution of the PA/ED. Project must accept some risk that work to date could not anticipate some additional environmental study	Environmental/ Design	1/28/2016
Active	17	ROW	BART encroachment approval for Managed Lane Signs	Due to the need to install facilities inside BART Barrier for Alternative 2, approval may not be easily obtained, resulting in additional costs or need to construct outside widening	Project assumes approval and agreement could be obtained for construction of sign structures within BART barrier	20	40	\$1,000,000	\$2,000,000	\$5,000,000	\$800,000	20	120	240	38	P1		Median overhead sign structures will require construction activities and permanent improvements inside of the existing BART barrier which will require, coordination, concurrence and final approval from BART.	Mitigate	If Alternative 2 moves forward, engage BART, both staff and decision making body (Board) at the inception of the PA/ED alternatives analysis as this is a critical element of alternative 2.	PM	9/18/2015
Active	18	Design	Managed Lane signs may impact BART facilities	Due to construction of signs w/in BART ROW, existing BART facilities may be impacted, requiring relocation and reconstruction of conduits, traction power, boxes or other facilities.	Alternative 2 assumes existing facilities can be avoided	35	65	\$500,000	\$1,500,000	\$2,500,000	\$750,000	0	60	240	50	P1		BART facilities, including power, duct bank and other elements may be physically impacted by barrier and sign structure construction.	Avoid	Conduct as-built and field reviews, as well as mapping and potholing to identify any potentially impacted facilities and avoid impacts to the degree possible by moving proposed facilities as allowable.	Project Engineer	9/18/2015
Active	19	Design	Replacement of existing BART barrier	Due to reconstruction of existing inside shoulder, the existing BART barrier may require reconstruction to current standard design.	Alternative 2 and 3 assume that the existing barrier may be preserved	10	50	\$1,500,000	\$2,000,000	\$2,500,000	\$600,000	0		0	0	P1		Existing BART barrier is based upon a Type 50 shape. Shoulder is being replaced against the existing barrier. Replacement of the barrier may be required for the length of the project adjacent to where the existing shoulder is being reconstructed	Accept	Work with Caltrans design staff to determine the conditions under which the barrier needs to be replaced. If necessary, seek additional construction funds to cover the additional costs.	Project Engineer	9/2/2015
Active	20	PM	Shoulder running lane as Pilot Project	Due to requirement of the shoulder running lane projects will be consider a Pilot project, the improvement may discontinue operating after a set period for the Pilot Project.	Alternative 2 would need to move forward as Pilot projects	0	35	\$50,000,000	\$75,000,000	\$100,000,000	\$13,125,000	0		0	0	P1		Shoulder running projects are currently viewed as pilot projects. Pilot project policy requires evaluation of the effectiveness of pilots and can require removal of improvements if the pilot if it is not considered successful	Accept	Monitor effectiveness and safety performance of shoulder running project if constructed. Implement state of the design elements into project.	PM	1/28/2016
Active	21	Organizational	Bids may come in high	As a result of an improving economy, bids may come in high, which would lead to funding shortfall.	Project assumes the bids will be close to Engineers estimate.	0	20	\$0		\$5,000,000	\$250,000					P3		Based on Input from PDT members	Avoid	Engineers estimate to be done to reflect most current bidding environment costs.		
Active	22	Construction	Allocation for unidentified risks	Contingency needs to be allocated (based on industry practice) for issues that are missed when identifying uncertain events.	Industry accepted practical recommendations for including "unknown unknowns" into probabilistic cost and schedule risk models are used.	100	100	\$0	\$0	\$0	\$0	0		0	0	P3		Size of "unknown unknown" allowances is dependent on the novelty of the project, stage of development of the project and type of industry.	Accept	Industry recommends that a standard project (ie low degree of novelty), should carry a 1% of capital cost allowance for unidentified risks, during the construction phase.		
Active	23	Construction	Support Costs Due to weather days	When contractor is allocated a weather day. COS costs will be incurred to the department. This risk is to cover all COS incurred to the Department. There are no delay costs.	No weather days were anticipated by the design team.	80	100	\$0	\$0	\$0	\$0					P3		Based on CT historical data .	Accept	Based on CT historical data. Projects with similar working days have an average of 0%- 10% of project working days.	PM	11/24/2015
Active	24	Design	COS costs due to delay	Additional support costs will be needed if the project is delayed during design phase.Cumulative costs of all Design risks.	COS costs	100	100	\$0	\$2,001,455	\$4,002,909	\$2,001,455					P1		This is cumulative of all the active risks with "P1" in column Q	Accept	See individual responses to the various design risks that have schedule impacts.	PM	11/24/2015
Active	25	Design	Indirect costs of Project Design/RTL Delay: (Mostly Escalation Costs)	If the project gets delayed in Design phase,RTL will be delayed resulting in Escalation of project costs.This is a cumulative of all costs due to delay of RTL.	Has Escalation cost	100	100	\$0	\$0	\$0	\$0					P1		This is cumulative of all the active risks with "P1" in column Q	Accept	See individual responses to the various design risks that have schedule impacts.	PM	11/24/2015
Active	26	Construction	COS costs due to delay	Cumulative costs of additional Construction COS needed due to delays in construction phase.	COS costs	100	100	\$0	\$0	\$0	\$0					P3		This is cumulative of all the active risks with "P3" in column Q	Accept	See individual responses to the various construction risks that have schedule impacts.	PM	11/24/2015

RISK REGISTER LEVEL	3	PROJECT NAME	SR4 Operational Improvement Project				DIST- EA	04-1J030K	PROJECT MANAGER	Laurie Lau		D4 RISK MANAGER	Patrick Treacy/Pradeep Narra				TOTAL COST (Capital +Support)	\$0.00						
PROJECT PHASE	PID	PDT MEMBERS	RISK ASSESSMENT										TOTAL DAYS (Construction + Initial review (30days)+ Closeout (60 days))	90										
Risk Identification						Probability		Cost Impact (\$)				Time Impact (days)				P1/P3	C/S	Rationale	Risk Response					
Status	ID #	Category	Title	Risk Statement	Current status/assumptions	Low	High	Low	Most likely	High	Probable	Low	Most likely	High	Probable				Strategy	Response Actions	Risk Owner	Updated		
Active	27	Construction	Indirect costs of Project Construction: (TRO & TRO+ & Escalation)	Cumulative costs of delays due to any of the other risk items occurring in construction phase. these are the indirect costs associated with occurrence of any of identified risks causing a construction delay.	Has CO delay costs (TRO, TRO+ and Escalation Costs)	100	100											P3		This is cumulative of all the active risks with "P3" in column Q	Accept	See individual responses to the various construction risks that have schedule impacts.	PM	11/24/2015
Active	28	Design	Bridge widening next to BART median	Construction of bridge widening next to BART median would require BART review and may need to enter into a cooperative agreement for reimbursement. If agreement is not execute timely, BART review may be delay.	Alternatives 2 and 3 assume bridge widening next to BART median	10	50	\$100,000	\$500,000	\$2,500,000	\$310,000	0	100	240	34	P1		Bridge widening design would require BART review.	Accept	If Alternative 2 moves forward, engage BART, both staff and decision making body (Board) at the inception of the PA/ED alternatives analysis as this is a critical element of alternative 2.	PM	10/4/2016		