DRAFT Risk Assessment Report

Broadway Bridge Feasibility Study: Conceptual Alignment Alternatives Risk Assessment

June 2017

Prepared by

Value Management Strategies, Inc.
& Mark Thomas & Company

Value Management Strategies, Inc.

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Date: June 16, 2017

To: **Zach Siviglia**
Project Manager
Mark Thomas & Company

Subject: Broadway Bridge Conceptual Alignment Alternatives Risk Assessment
Draft Report

Dear Zach:

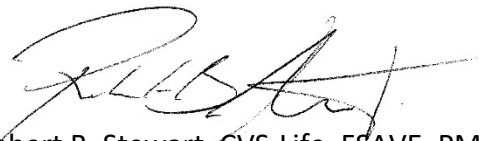
Value Management Strategies, Inc. is pleased to transmit this Draft Report for the referenced project. This report summarizes the events of the study conducted June 6-8, 2017.

Please complete your review of this report and provide your comments and recommendations to me for inclusion in the final report.

If you have any questions or comments concerning this report, please contact me at (503) 957-9642 or email rob@vms-inc.com.

Sincerely,

VALUE MANAGEMENT STRATEGIES, INC.



Robert B. Stewart, CVS-Life, FSAVE, PMP, PMI-RMP
President / CEO

Copy: (PDF) Addressee

NOTE TO READERS

The risk based estimating process utilized in the analysis conducted by Value Management Strategies, Inc. (VMS) through its Risk Assessment workshops is iterative in nature and represents a "snapshot in time" for that project and under the conditions known at that point in time. Additionally, the conceptual estimates provided to VMS to conduct the studies, estimate validation, and analysis will require further in-depth analysis and development throughout the program and project delivery process.

The risk assessment tools and techniques employed by VMS traditionally deal with identifiable and quantifiable project-type risks, i.e. those events that can occur in planning, design, bidding, construction, and changed conditions. The risk assessment process could also consider the larger, more difficult risks – political and management continuity and "acts of God" that can have very high impact in cost and schedule – but at this point, these types of risks have generally not been included. This is an area for review and development moving forward, particularly with respect to how to characterize such events in a useful manner for better management and project delivery.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY DRAFT

This Risk Assessment Study Report summarizes the events of the Risk Assessment workshop conducted on behalf of Mark Thomas & Company for the Broadway Bridge project in Sacramento, and West Sacramento, California. The risk workshop team was comprised of City of Sacramento and City of West Sacramento personnel, Mark Thomas & Company personnel, and led by Value Management Strategies, Inc. (VMS). This report presents the results and findings of the risk assessment workshop conducted from the perspective of identifying and quantifying project cost and schedule risk.

BROADWAY BRIDGE PROJECT OVERVIEW

The Broadway Bridge project seeks to construct a new bridge across the Sacramento River, connecting the City of Sacramento to the City of West Sacramento in the region just southeast of the US-50 Sacramento River crossing, near where US-50 and I-5 intersect in the City of Sacramento. Currently, the project is in a conceptual stage and stakeholders are working to determine an ideal bridge alignment.

Project stakeholders are currently considering six different alignments options (designated A, B, C1, C2, C3, D) which will theoretically initiate from Broadway on the City of Sacramento side of the Sacramento River, and terminate at various potential locations, including South River Rd., 15th St., and Jefferson Blvd., on the West Sacramento side of the Sacramento River. The bridge is currently anticipated to be constructed as an adaptable two-lane precast concrete and steel (for the movable-span) bascule structure. Construction is not expected to begin earlier than 2025, is anticipated to last 94 months, but may begin later depending on the nature of various constraints and factors still under consideration. The project is sited for a stretch of the Sacramento River which is currently home to copious oil and gas facilities owned by various private entities, including Shell, Ramos, Buckeye, Pacific Gas and Electric (PG&E), Phillips 66 Co., Chevron, and Kinder Morgan. Furthermore, a parcel of land formerly owned by Lonestar California Inc., that was recently purchased by a private developer, and the Miller Park Sacramento Marina are in the vicinity of the project site. Additional local features that may be impacted by the Broadway Bridge project include railroads on either side of the river, multiple wharf structures, pipelines, and utilities.

The Broadway Bridge is intended for use by cars, public transportation, rail transit, pedestrians, and bicyclists. The proposed bridge is expected to help relieve severe traffic congestion on US-50 and other thoroughfares connecting Sacramento to West Sacramento, and provide a means of safe transportation across the river for pedestrians and bicyclists.

RISK ASSESSMENT OBJECTIVES

The objectives of the Risk Assessment workshop were to:

- Analyze conceptual alignment alternatives to develop information that will support decision makers involved in determining the final bridge alignment.

- Develop a shared level of understanding among participants regarding threats and opportunities for the various alignments under consideration.
- Identify, validate, and quantify project risks as they relate to cost, schedule, and performance.

The methodology used to perform the analysis is detailed in the following section. A future planned risk assessment effort will perform a more thorough analysis of project cost and schedule risk focusing specifically on the 'preferred' alignment that is ultimately selected by project stakeholders. This risk assessment will conduct an integrated cost and schedule risk assessment to establish project cost and schedule contingencies, and a viable risk management plan, for the purposes of preserving project value. This quantitative risk assessment will be followed by a formal Value Analysis study that will consider alternatives to improve the value of the design while identifying additional risk response strategies.

RISK ASSESSMENT APPROACH

The following approach was used to achieve the key objectives of the risk assessment effort outlined above:

- Select specific conceptual alignments for focus of the risk assessment efforts.
    - Project stakeholders identified six conceptual alignments for the Broadway Bridge in advance of the study. For an overview of the conceptual alignments, see *Exhibit A*, included at the end of this section.
    - The assessment team reviewed the scope of the project as well as each specific alignment (barring alignment C2, which was excluded from study due to its similarity to the other C alignments) with a multi-disciplined team. This was a crucial step in ensuring that the team fully understood the project scope and associated constraints.
- Identify and quantify individual project specific event risks.
    - The assessment team identified event-driven uncertainties, including both threats (negative event risks) and opportunities (positive event risks), for the project in its entirety, and for each specific conceptual alignment.
    - A qualitative assessment was then performed on each risk that characterized the probability and impacts of each risk by assigning them values ranging from very low to very high. These qualitative values were assigned specific cost and schedule values based on quantitative scales that were developed and customized to suit the specific project capital costs in order to assess the magnitude of the cost impacts associated with each identified risk.

- Identify potential risk response strategies.
    - The assessment team developed uniquely tailored response strategies (which include accept, avoid, mitigate, and transfer, for threats, and exploit, enhance and share for opportunities) for each identified risk.
    - The effect of implementing the identified risk response strategies were then assessed, and quantified, wherever possible, to identify the benefits to the cost and schedule impacts of each risk.

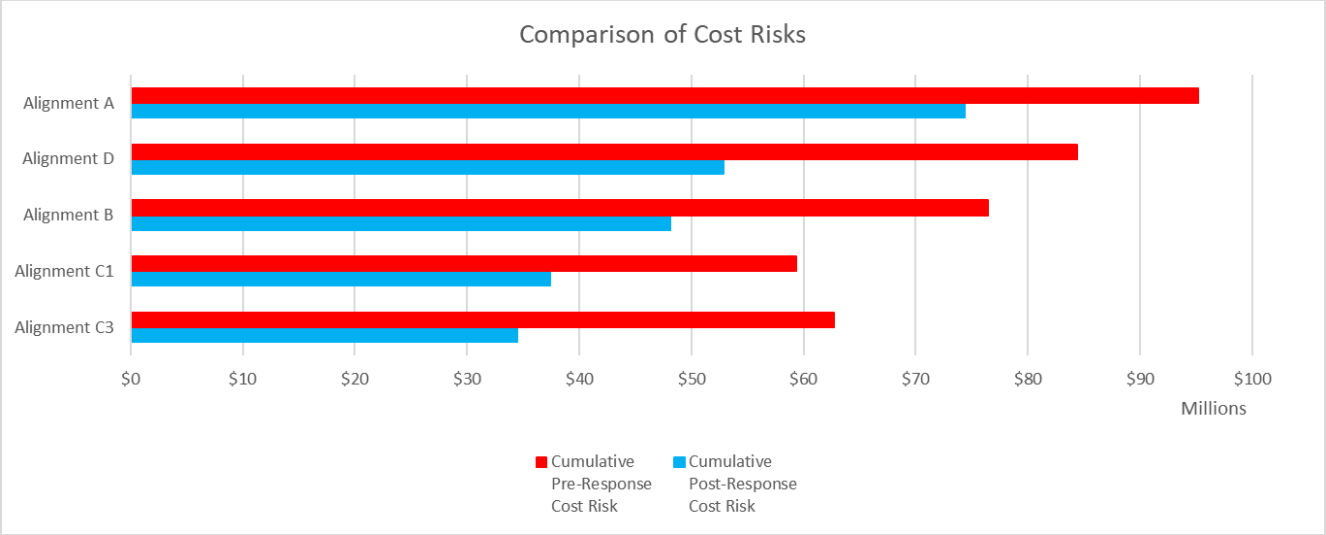
MAJOR FINDINGS

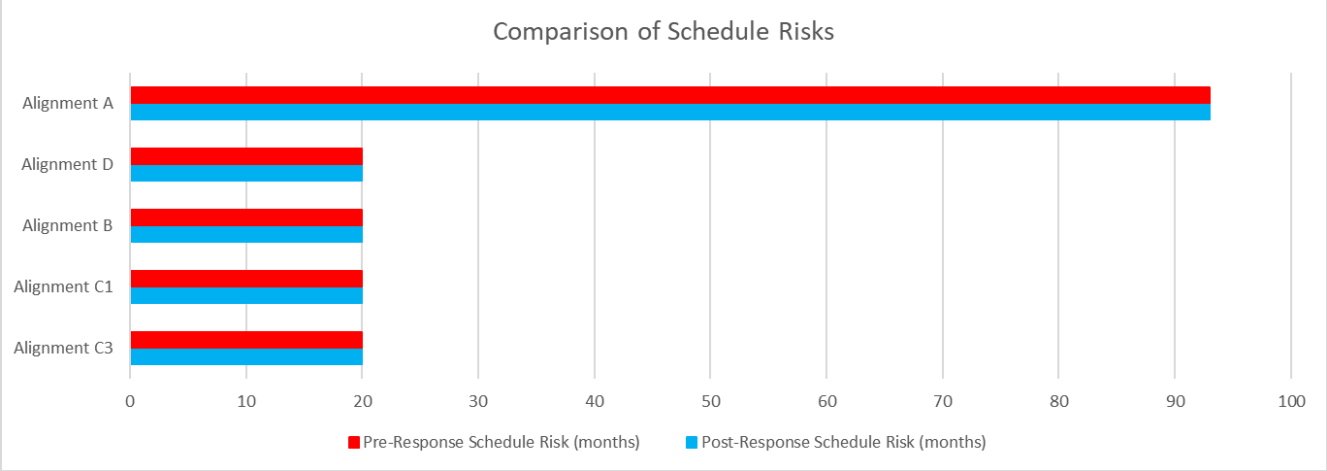
The estimated impact of the risks for each of the alignment alternatives evaluated in this study is summarized in the table below.

Alignment Alternative	Cumulative Pre-Response Cost Risk	Cumulative Post-Response Cost Risk	Pre-Response Schedule Risk (months)	Post-Response Schedule Risk (months)
Alignment A	$95,203,000	$74,363,000	93	93
Alignment B	$76,443,750	$48,093,750	20	20
Alignment C1	$59,315,625	$37,378,125	20	20
Alignment C3	$62,690,625	$34,509,375	20	20
Alignment D	$84,375,000	$52,903,125	20	20

The values for the cost risks represent the cumulative potential impact of all cost risks for both the "Pre-Response" and "Post-Response" conditions to the project. The "Pre-Response" condition assumes that the risks are not proactively managed while the "Post-Response" conditions assumes that the identified risk response strategies are actively implemented.

The schedule risk values are a simplistic representation of the sum of the single longest potential pre-construction (e.g., design, environmental, right-of-way, etc.) and construction risks. It is important to emphasize that these values have not been modeled in an integrated manner and are merely intended to communicate the relative level of risk facing each of the alignment alternatives. Further, the effect of escalation has not been factored into these values. The charts below provide a graphic comparison of these values. Based on the results of this risk assessment, Alignment A possesses significantly more cost and schedule risk relative to the others. At this time, the "C" Alignments appear to possess the least amount of risk to the project.





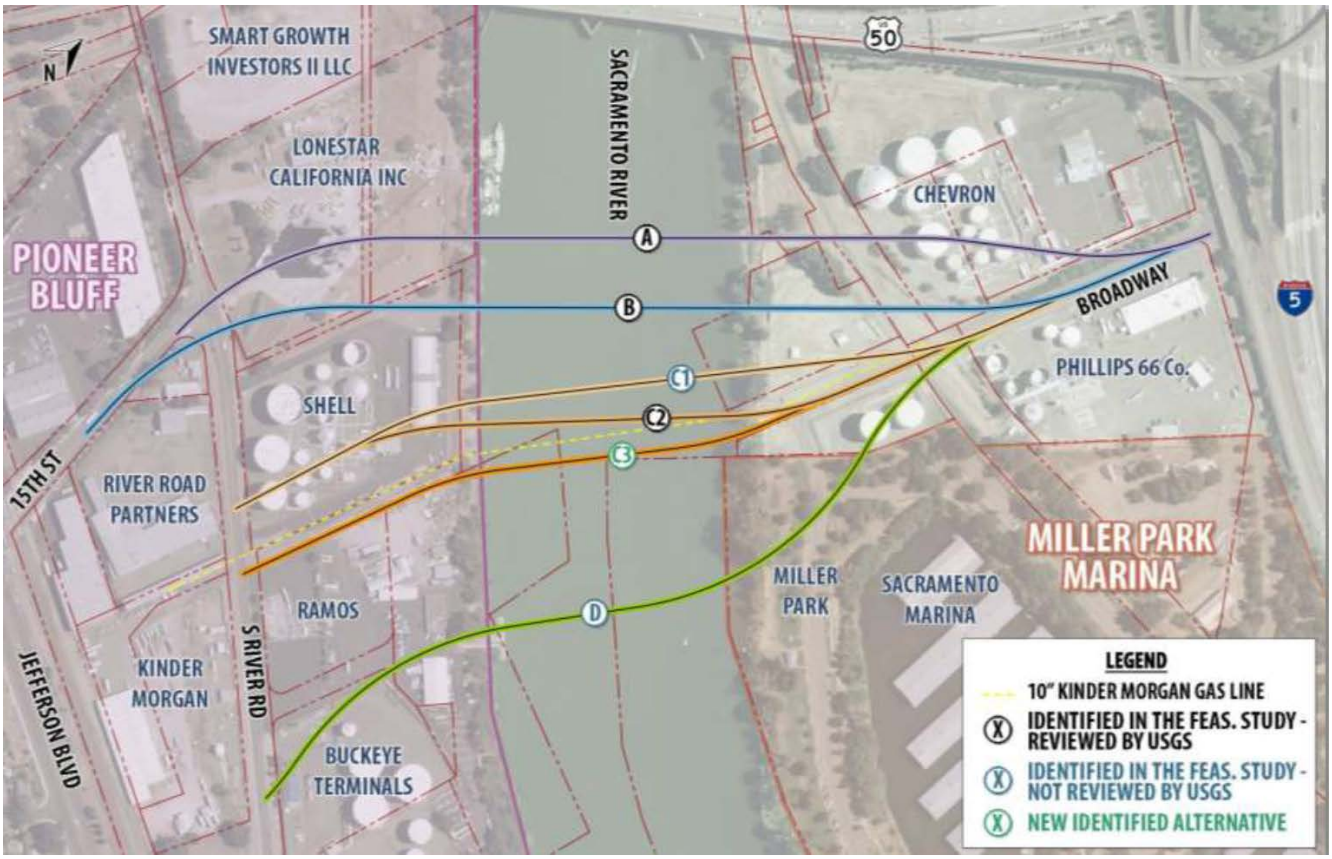
A comprehensive Risk Register was developed as a result of the work completed during the Risk Assessment workshop for each conceptual alignment alternative. The Risk Registers includes the following information:

- A qualitative and quantitative breakdown of all risks identified
- A SMART (Specific, Measurable, Attributable, Relevant, Time-Bound) Description of all risk identified
- Pre-response and post-response qualitative and quantitative data regarding the probability impact, and severity of all risks identified
- Risk Response Strategies, and Action Plan Descriptions (where applicable), for all risks identified

The Risk Register is accompanied by Tornado Charts identifying the relative priorities of key project risks for each alignment alternative, and a Risk Management Plan to help project stakeholders proactively manage and respond to the risks identified. The Risk Registers, Tornado Charts, and Risk Management Plans can be found in the *Risk Information* section of this report.

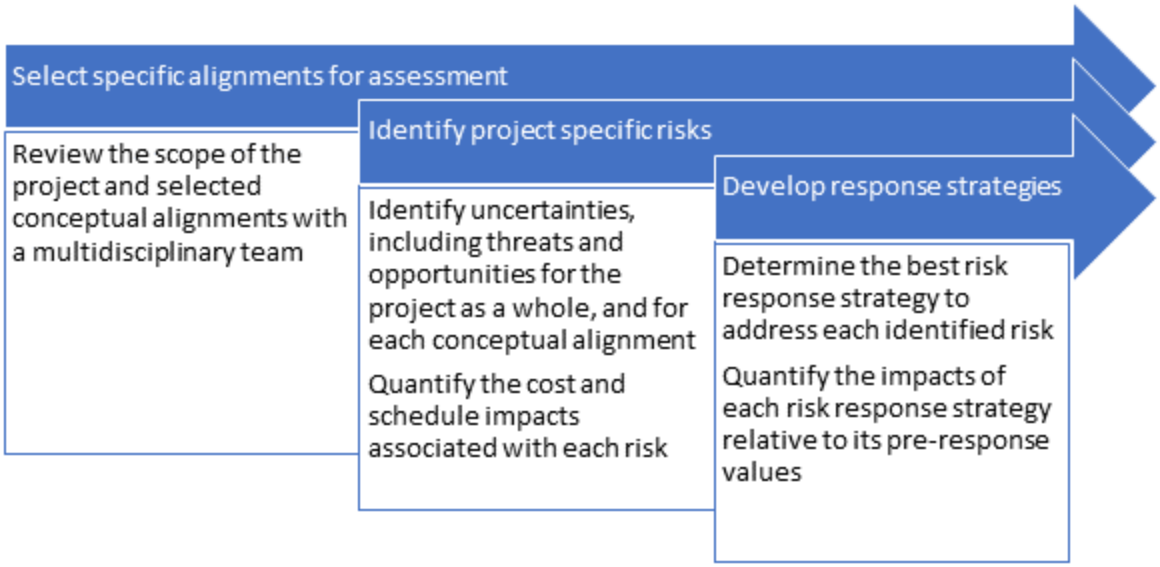
SUPPLEMENTARY DOCUMENTATION

EXHIBIT A: Conceptual Alignment Alternatives



ANALYSIS METHODOLOGY

The methodologies used to perform the risk assessment are described in detail in the following pages. The chart below articulates the general process, hierarchy, and relationship of each of the steps undertaken.



RISK ASSESSMENT APPROACH

The Risk Assessment workshop occurred June 6-8, 2017 at the Sacramento offices of Mark Thomas & Company. The process involved a series discussions and activities that examined the Broadway Bridge project and each conceptual alignment selected for review with respect to scope, cost and schedule risk, and their relationship to project delivery. The following is a brief description of the activities conducted during the workshop as part of the risk assessment effort.

PROJECT SCOPE REVIEW

The team began the risk assessment process by first reviewing its scope information. This included a review of:

- Broadway Bridge Feasibility Study documents
- Concept drawings (plans and profiles)
- Right-of-way maps & Google Maps
- Cost estimates

This was valuable in that it afforded the assessment team an opportunity to develop a shared understanding of the project and its issues. Once a shared understanding of the overall project and each conceptual alignment was established, the team was then able to begin identifying and considering project risks.

RISK ASSESSMENT PROCESS

The risk assessment analysis process included the following steps:

- **Establish Risk Scales:** A standardized quantitative scale was developed in order to help the team assess both the probabilities and cost impacts of project risks. Ranges were defined from "Very Low" to "Very High" for probability, cost risk exposure, and schedule risk exposure as illustrated in the table below. The ranges of likelihood are defined as a percentage. The ranges of cost impact are defined in dollars. The ranges of schedule impact are defined in months. Note that the range of cost and schedule impact (i.e., 'Range ($M)'; 'Range (Months)') presented below is illustrative in nature and is generated as a percentage of total project costs, and total project schedule, respectively.

Level	Probability	% Total (Cost)	Range ($M)	% Total (Schedule)	Range (Months)
Very Low	0-20%	0-2.5%	$0 - $3.375	0-2.5%	0-2.4
Low	20-40%	2.5-5%	$3.375 - $6.75	2.5-5%	2.4-4.7
Medium	40-60%	5-7.5%	$6.75 - $10.125	5-7.5%	4.7-7.1
High	60-80%	7.5-10%	$10.125 - $13.5	7.5-15%	7.1-14.1
Very High	90-99%	10-15%	$13.5 - $20.25	15-25%	14.1-23.5

- **Identify and Characterize Risks:** The team began by identifying risks with respect to the project in its entirety. The list of preliminarily identified risks were further expanded and added to, as each individual conceptual alignment was then evaluated. Each of the risks were discussed and the risk descriptions were articulated and defined to help participants better consider the probabilities and impacts associated with each risk.
    - Each individual identified risk was categorized according to a defined risk breakdown structure (RBS). The consolidated RBS used for the purposes of the risk assessment was developed in order to facilitate and expedite the identification of risks and included the following categories:
        - Construction
        - Design
        - Environmental
        - Geotechnical
        - Hydraulics
        - Market Conditions
        - Permits & Approvals
        - Public Interface
        - Right-of-Way

    - Structures
    - Utilities & Agreements

  - The relative nature of each individual risk was identified. Risks were either defined as "threats," which would result in a negative cost or schedule impact to the project; or "opportunities," which would result in a positive cost or schedule impact to the project.

- **Analyze Risks:** The analysis of risks followed the sequential steps below.

  - The likelihood of each individual risk (probability) was identified. The probability of each risk occurring was discussed by the team using the standard scale presented above. The probability did not consider a specific level of impact occurring, merely the likelihood that it would occur in some way, shape, or form.

  - The degree of risk exposure (expected impact) was identified. The "most likely" range of the cost or schedule impact of the risk was identified using the scale presented above that was standardized to a relative percentage of the total project cost (less unallocated contingencies and cost reserves) and schedule. Where possible, the team described what the impacts could be.

  - The "expected value" for each risk is calculated by using the following algorithm:

$$\left(\frac{(min + (4 \times most\ likely) + max)}{6}\right) \times probability = EV$$

    For example, assume a risk has a potential schedule impact that has a minimum value of 2 months; a most likely value of 4 months; and a maximum value of 12 months. There is a 50% probability that the risk will occur. The expected value (EV) is calculated as follows:

$$\left(\frac{(2 + (4 \times 4) + 12)}{6}\right) \times 0.5 = 2.5\ months$$

    The expected values for cost and schedule impacts for each risk are referred to as the "Pre-Response" condition. In other words, if the risks are not proactively managed, they will likely produce the expected values identified in the analysis.

- **Develop Responses:** Each risk was discussed by the team and potential risk response strategies were identified for each.

  For threats (negative risks), the following potential strategies are possible:

  - Accept – The threat is "accepted" by the project team and the appropriate level of contingency related to cost and schedule will be reserved.

- Avoid – The project will be modified in some way to completely avoid the threat from occurring. This will usually require a change in scope that may impact the base cost and/or schedule of the project.
- Mitigate – The severity and/or probability of the threat will be reduced by implementing the risk response strategy. This is perhaps the most common risk response strategy.
- Transfer – The threat will be transferred to a third party. Transferring a risk generally comes at a cost which the responsible party will pass on to the project owner.

The following possible risk response strategies are possible for opportunities:

- Exploit – The opportunity will be actively pursued to ensure that it happens. This may require additional time and/or money to do so.
- Enhance – The opportunity will be pursued in some way that will increase the cost and/or schedule benefits or probability of it occurring.
- Share – The benefits of the opportunity will be shared between multiple parties. Doing so will likely reduce the total benefit being received by one party but will increase the probability of it occurring.

The effects of the risk response strategies are then assessed regarding how they will modify the probability and impacts of each risk. The process used is similar to what has been described above in the previous step, "Analyze Risks." The expected values for risk response strategies are referred to as the "Post-Response," or managed state assuming that they are proactively implemented.

RISK INFORMATION

The following pages include the Tornado Charts, Risk Registers, and Risk Management Plans for each of the five conceptual alignment alternatives evaluated, and a brief overview of these report elements, intended to assist readers in interpreting the data presented.

BASE COST AND SCHEDULE ASSUMPTIONS

Risk Scales were developed based upon the project cost and schedule. For the purposes of this Risk Assessment, cost data developed by CH2M Hill was used to derive a baseline cost. The team opted to select the adaptable two-lane bridge concept with pre-cast concrete approach spans and a steel lift-span as the basis for the project. The team then backed out escalation and contingency (assumption of 25% of construction costs) to come to a "raw" adjusted project cost. Note that this does not include right of way costs, however, the risks identified do.

CH2M Hill Costs for Alignment C1	
Construction Costs	
Roadway	$27,600,000
Approach Spans	$12,122,000
Life-Span	$96,310,000
Total Construction	$136,100,000
-25% Contingency	$34,025,000
Adjusted Construction	***$102,075,000***
Support Costs	
PA&ED	$4,083,000
PS&E	$10,888,000
Construction Support	$16,332,000
Total Support Costs	***$31,400,000***
Project Cost for Risk Assessment	**$132,475,000**

Costs for Alignments A, B, C1 and C2 in the CH2M Hill estimates were within several million dollars of each other. Based on this, an average "rounded" cost of $135 million was used for the purposes of scaling the risk values.

It is recognized that the project may be delayed for some time before moving forward, however, for the purposes of this Risk Assessment, a baseline schedule was estimated based on a start date of

June 5, 2017 that would result in the completion of construction on April 1, 2025 for a total of 94 months.

Type	Start	End	Description
Phase	6/5/2017	12/31/2019	Design
Milestone	12/31/2019	12/31/2019	Record of Decision
Phase	1/1/2020	12/31/2021	Final Design
Phase	1/1/2022	3/31/2022	Advertise, Bid, Award
Milestone	4/1/2022	4/1/2022	NTP
Phase	4/1/2022	4/1/2025	Construction

EXPLANATION OF RISK TORANDO CHARTS

In order to identify and prioritize risks with the largest cost and schedule impacts, a plot referred to as a Tornado Chart was developed. Threats are plotted to the right of the central axis, while opportunities are plotted to the left. In the context of this project, the number of risks identified in the workshop that could be considered opportunities were limited.

The highest priority risk threats and opportunities are at the top of the Tornado Chart, while the lowest risk threats or opportunities are at the bottom of the Tornado Chart, making the conical tornado shape. In the context of Risk Management, the highest risk opportunities should be strongly considered for implementation to gain cost and schedule advantages. The highest risk threats require the most management and have the highest need for appropriate risk response strategies and proactive risk management. The risks at the bottom of the Tornado Chart are of a lower priority relative to project cost and schedule and will require reduced levels of management or response.

The degree of risk portrayed in the Tornado Chart is based on a calculated value that determines relative risk by multiplying the probability of occurrence and the most likely impact to generate the expected value of impact. The Tornado Charts on the following pages indicate the highest relative cost and schedule risks identified by the risk workshop team prior to responding to the risks. Additionally, Tornado Charts depicting the greatest total risks with combined consideration of both cost and schedule indicate those risks that have the greatest total impact to the project.

The Tornado Charts primarily display the highest priority risks for risk response. The series of Tornado Charts display the ranking of the identified cost and schedule risks relative to each other. Furthermore, the Tornado Charts show the anticipated relative change to the risk event as a result of proactively responding to and managing the risk. The two different states are labeled as “Pre-Response” and “Post-Response” indicating that the risk is in a status of being unmanaged or managed, respectively.

EXPLANATION OF RISK REGISTERS

Risk registers have been prepared for each of the five alignment alternatives. Provided below is a brief description of the organization and content of this information to assist the reader.

- **Risk Information**
    - **Risk #** – A unique numerical identifier assigned to each risk.
    - **Status (Pre/Post)** – A risk's status may be: Active (A), Dormant (D), or Retired (R). Each risk is assigned a pre-response and post-response "status" that assists project stakeholders in quickly determining the disposition of a risk at any given time.
    - **Risk Category** – Each risk is categorized according to a predefined Risk Breakdown Structure (RBS) which, for this project, includes categories like "construction", "design", and "right-of-way" to help project stakeholders easily classify and organize project risks.
    - **Impacted Phase** – Each risk is linked to an "impacted phase", i.e., the part of the project to which it poses a threat or presents an opportunity. For this project, each conceptual alignment alternative was identified as a "phase". In other words, phases for this project include each individual conceptual alignment alternative (A, B, C1, C3, D), and "All Alignments".
    - **Risk Event Name** – The name or designation assigned to each risk during the risk identification process.
    - **S.M.A.R.T. Risk Description** – A Specific, Measurable, Attributable, Relevant, and Time-Bound description used to characterize each risk.
    - **Risk Trigger (Symptoms)** – The event, action, or situation that will cause a risk to occur. Alternative, a risk can be defined by the symptoms that would appear indicating that it has happened.
    - **Additional Comments** – Important supplemental notes for stakeholders to consider when evaluating each risk.

- **Unmanaged State (Pre-Response)** – All columns under this heading display the values assigned to each risk before the risk is addressed or proactively managed.
    - **Probability** – The overall likelihood that a risk will occur.
    - **T/O** – Indicates whether a risk is classified as a threat or an opportunity.
    - **Impact (Cost)** – This number represents the anticipated costs incurred (threat) or saved (opportunity) as the result of a risk occurring. It is the "most likely" value of the cost risk exposure range, determined when quantitative risk scales were established and calibrated for the project, prior to assessment.
    - **Expected Value (Cost)** – The theoretical monetary value of a risk in its pre-response (not proactively managed) state, determined using the algorithm detailed in the above

Analysis Methodology section of the report, which factors together the cost risk exposure range and probability assigned to the risk.

- **Impact (Schedule)** – This number represents the anticipated schedule delays incurred (threat) or improvements to the project schedule (opportunity) as the result of a risk occurring. It is the "most likely" value of the schedule risk exposure range, determined when quantitative risk scales were established and calibrated for the project, prior to assessment.
- **Expected Value (Schedule)** – The theoretical schedule value of a risk in its pre-response (not proactively managed) state, determined using the algorithm detailed in the above *Analysis Methodology* section of the report, which factors together the schedule risk exposure range and probability assigned to the risk.

- **Managed State (Post-Response)** – All columns under this heading display the values assigned to each risk after a risk response strategy has been developed and assumes the risk is being proactively managed.

  - **Probability** – The likelihood that a risk will occur in its managed state.
  - **T/O** – Same as above.
  - **Impact (Cost)** – Same as above, but reflecting any changes precipitated by the selected risk response strategy.
  - **Expected Value (Cost)** – Same as above, but reflecting any changes precipitated by the selected risk response strategy.
  - **Impact (Schedule)** – Same as above, but reflecting any changes precipitated by the selected risk response strategy.
  - **Expected Value (Schedule)** – Same as above, but reflecting any changes precipitated by the selected risk response strategy.

EXPLANATION OF RISK MANAGEMENT PLAN

Risk Management Plans have been prepared for each of the five alignment alternatives. Provided below is a brief description of the organization and content of this information to assist the reader.

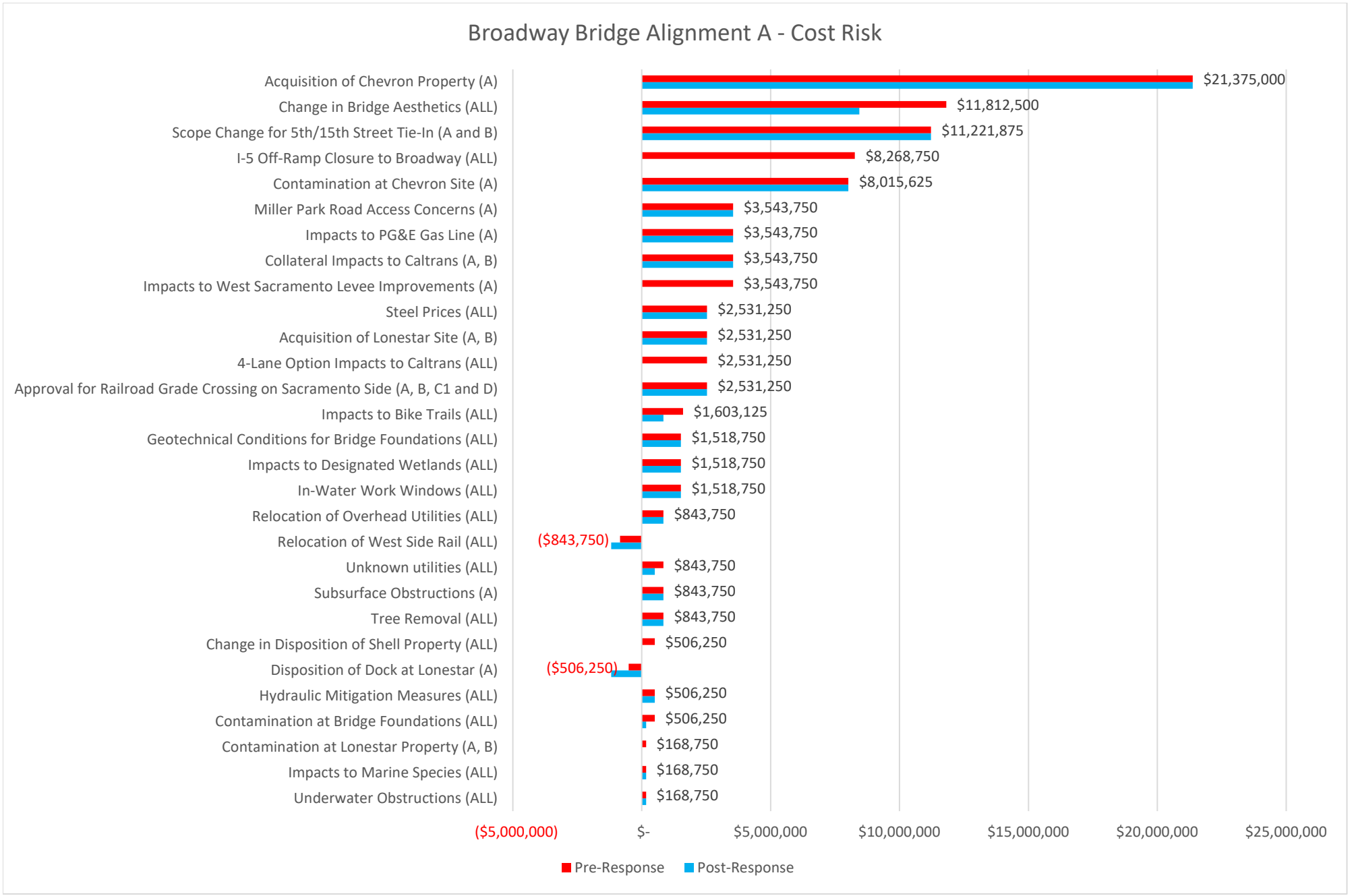
- **Risk Information** – Same as the Risk Register, see above.

- **Risk Management Plan: Monitor and Control**

  - **Risk Response Strategy** – The strategy selected to manage each risk. Response strategies include: accept, avoid, mitigate, and transfer (threats); exploit, enhance, share (opportunities).
  - **Action Plan Description** – A description of the necessary steps to appropriately manage each risk based on the response strategy.
  - **Risk Owner** – The party responsible for monitoring and managing each risk.

- **Risk Review Milestone / Frequency** – The next time or times, or the frequency with which this risk should be evaluated and response strategies reconsidered to ensure its effective management.
- **Base Cost Impacts** – The expected monetary value imposed on the project by implementing the response strategy selected for each risk, if applicable.
- **Base Schedule Impacts** – The expected changes to the project schedule precipitated by the selected response strategy for each risk, if applicable.
- **Updates** – Where updates relevant to each risk are captured as risks are proactively managed.

Summary of Alignment A Risks


Broadway Bridge Alignment A - Cost Risk
Acquisition of Chevron Property (A)
Change in Bridge Aesthetics (ALL)
Scope Change for 5th/15th Street Tie-In (A and B)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination at Chevron Site (A)
Miller Park Road Access Concerns (A)
Impacts to PG&E Gas Line (A)
Collateral Impacts to Caltrans (A, B)
Impacts to West Sacramento Levee Improvements (A)
Steel Prices (ALL)
Acquisition of Lonestar Site (A, B)
4-Lane Option Impacts to Caltrans (ALL)
Approval for Railroad Grade Crossing on Sacramento Side (A, B, C1 and D)
Impacts to Bike Trails (ALL)
Geotechnical Conditions for Bridge Foundations (ALL)
Impacts to Designated Wetlands (ALL)
In-Water Work Windows (ALL)
Relocation of Overhead Utilities (ALL)
Relocation of West Side Rail (ALL)
Unknown utilities (ALL)
Subsurface Obstructions (A)
Tree Removal (ALL)
Change in Disposition of Shell Property (ALL)
Disposition of Dock at Lonestar (A)
Hydraulic Mitigation Measures (ALL)
Contamination at Bridge Foundations (ALL)
Contamination at Lonestar Property (A, B)
Impacts to Marine Species (ALL)
Underwater Obstructions (ALL)
$21,375,000
$11,812,500
$11,221,875
$8,268,750
$8,015,625
$3,543,750
$3,543,750
$3,543,750
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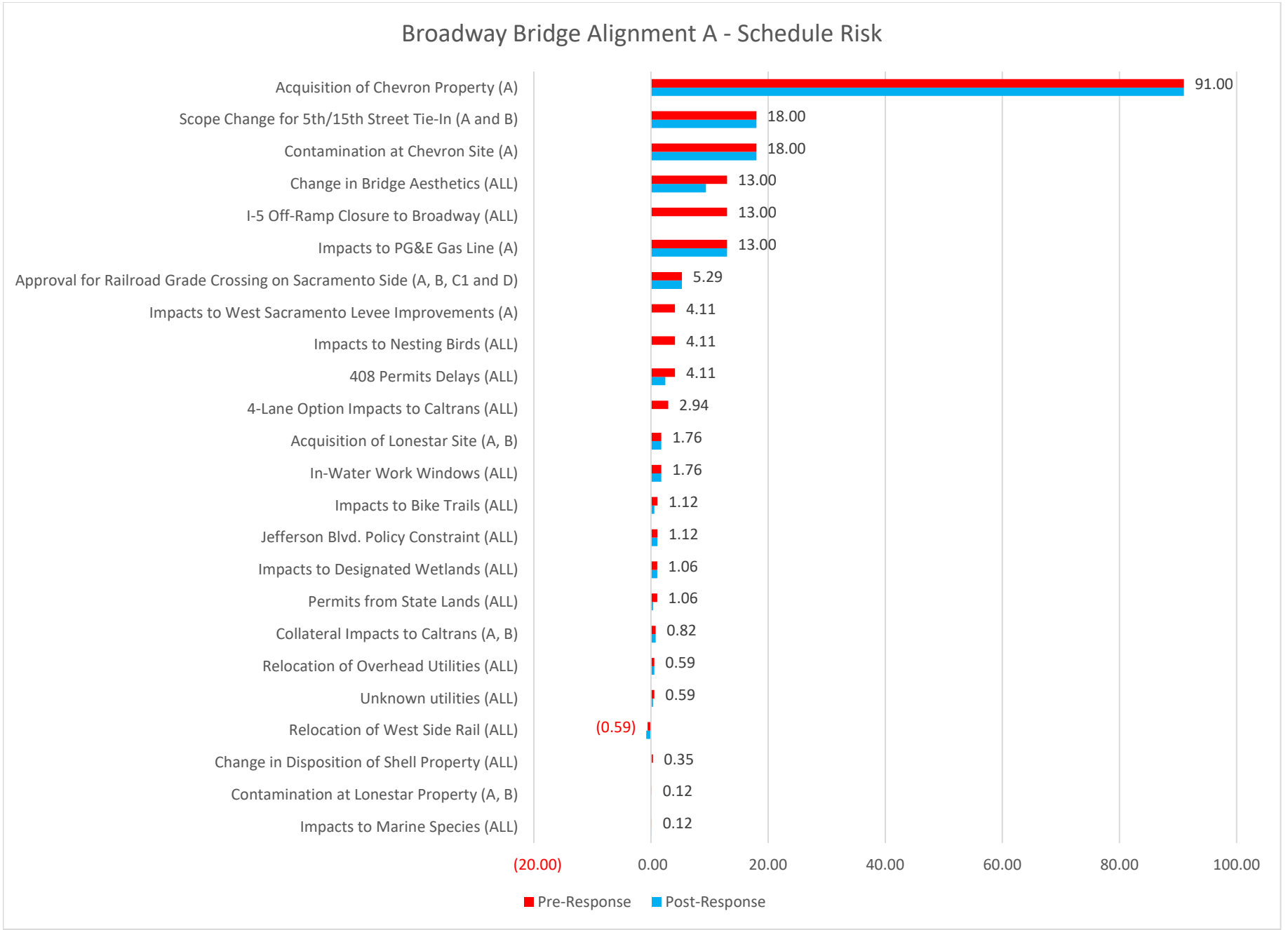
Pre-Response
Post-Response


Broadway Bridge Alignment A - Schedule Risk
Acquisition of Chevron Property (A)
Scope Change for 5th/15th Street Tie-In (A and B)
Contamination at Chevron Site (A)
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Impacts to PG&E Gas Line (A)
Approval for Railroad Grade Crossing on Sacramento Side (A, B, C1 and D)
Impacts to West Sacramento Levee Improvements (A)
Impacts to Nesting Birds (ALL)
408 Permits Delays (ALL)
4-Lane Option Impacts to Caltrans (ALL)
Acquisition of Lonestar Site (A, B)
In-Water Work Windows (ALL)
Impacts to Bike Trails (ALL)
Jefferson Blvd. Policy Constraint (ALL)
Impacts to Designated Wetlands (ALL)
Permits from State Lands (ALL)
Collateral Impacts to Caltrans (A, B)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Contamination at Lonestar Property (A, B)
Impacts to Marine Species (ALL)
91.00
18.00
18.00
13.00
13.00
13.00
5.29
4.11
4.11
4.11
2.94
1.76
1.76
1.12
1.12
1.06
1.06
0.82
0.59
0.59
(0.59)
0.35
0.12
0.12
(20.00)
0.00
20.00
40.00
60.00
80.00
100.00
Pre-Response
Post-Response

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
2	A - A	Right-of-Way	Alignment A	Acquisition of Chevron Property (A)	The acquisition strategy for the Chevron property would involve relocation, not closure. The study team anticipates that a five-year period will be required for all relocation activities after Record of Decision (ROD) is obtained.			95%	T	$22,500,000	$21,375,000	T	96.00	91.00	95%	T	$22,500,000	$21,375,000	T	96.00	91.00
3	A - A	Permits & Approvals	Alignment A	Approval for Railroad Grade Crossing on Sacramento Side (A, B, C1 and D)	Four of the alignments will require permits for new or retrofitted railroad grade crossings on the Sacramento side of the river. There is potential for delays related to CPUC approval and possible additional mitigations that may be required.		A and B would require new crossings while C and D would be retrofit.	50%	T	$5,062,500	$2,531,250	T	10.57	5.29	50%	T	$5,062,500	$2,531,250	T	10.57	5.29
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	T	$5,062,500	$1,518,750	T	5.88	1.76
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			30%	T	$1,687,500	$506,250	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	T	3.53	2.47
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
12	A - A	Hydraulics	Alignment A	Impacts to West Sacramento Levee Improvements (A)	Alignment A is most significantly impacted by this risk. This is primarily related to the dock structure and how it interfaces with the levee structure. It is likely that alignment A will precipitate additional cost and schedule impacts related to addressing flood protection concerns in this area.			70%	T	$5,062,500	$3,543,750	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			30%	T	$5,062,500	$1,518,750	T	3.53	1.06	30%	T	$5,062,500	$1,518,750	T	3.53	1.06
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			95%	T	$1,687,500	$1,603,125	T	1.18	1.12	50%	T	$1,687,500	$843,750	T	1.18	0.59
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			50%	T	$5,062,500	$2,531,250	T	5.88	2.94	50%	--	$-	$-	--	0.00	0.00
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			70%	T	$11,812,500	$8,268,750	T	18.80	13.00	70%	--	$-	$-	--	0.00	0.00
18	A - A	Geotechnical	Alignment A	Subsurface Obstructions (A)	There is the potential risk of encountering subsurface obstructions and/or archeological assets at the Lonestar site for alignment A, mainly related to the foundations of demolished structures.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			50%	T	$1,687,500	$843,750	T	1.18	0.59	30%	T	$1,687,500	$506,250	T	1.18	0.35
20	A - A	Right-of-Way	Alignment A	Acquisition of Lonestar Site (A, B)	This site is currently fully entitled for development as 'mixed use' (commercial and residential). Past experience has indicated that dealing with Lonestar is very challenging. It is likely that there will be cost and schedule impacts associated with acquiring this property.			50%	T	$5,062,500	$2,531,250	T	3.53	1.76	50%	T	$5,062,500	$2,531,250	T	3.53	1.76

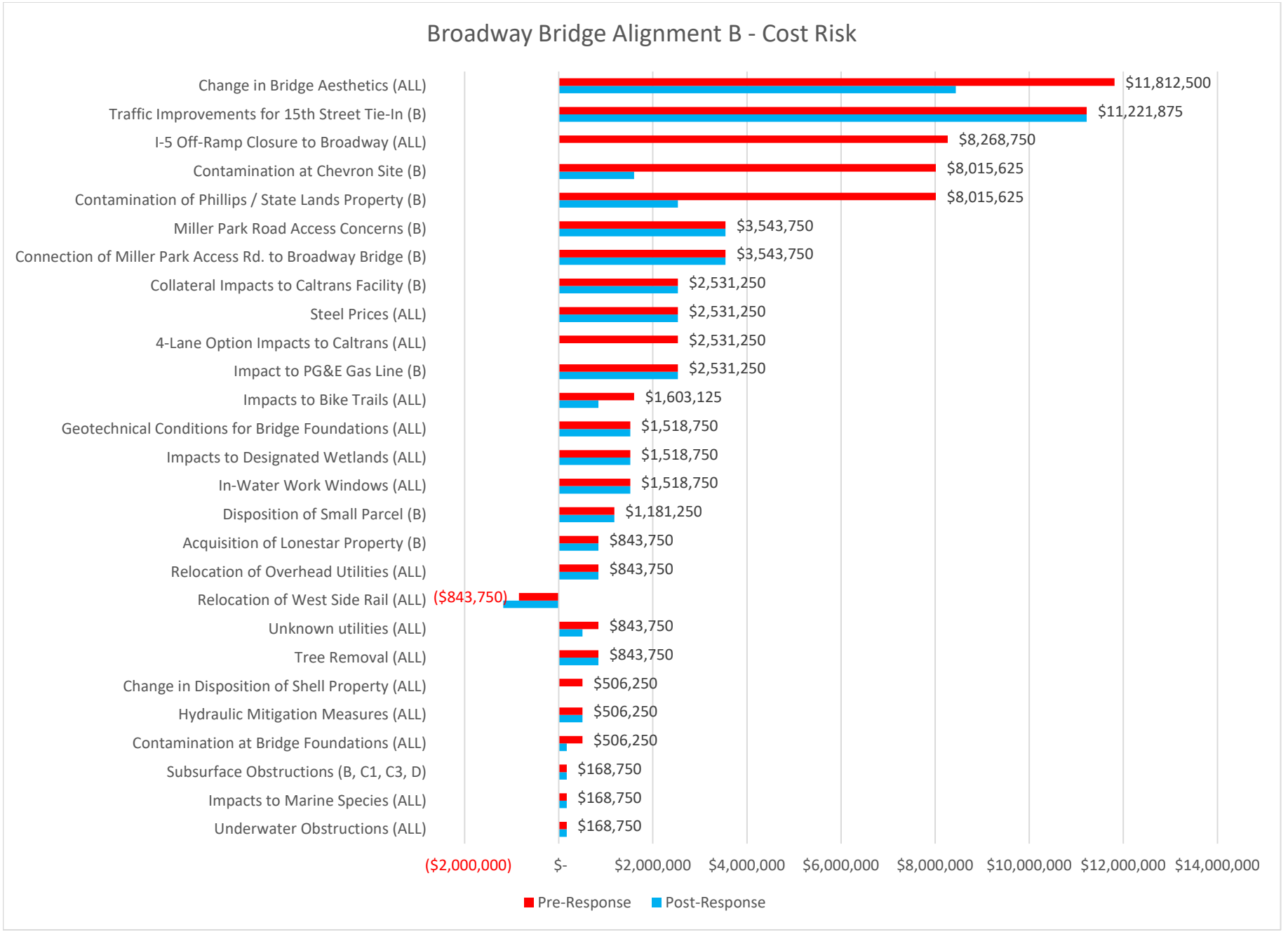
Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			30%	T	$1,687,500	$506,250	--	0.00	0.00	30%	T	$1,687,500	$506,250	--	0.00	0.00
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			30%	--	$-	$-	T	3.53	1.06	30%	--	$-	$-	T	1.18	0.35
24	A - A	Design	Alignment A	Collateral Impacts to Caltrans (A, B)	If alignment A is selected, and Riverfront street is redesigned, there is a potential for collateral impacts to Caltrans facilities, including a maintenance facility and the loop on-ramp for SR-50, on the West Sacramento side of the proposed bridge.			70%	T	$5,062,500	$3,543,750	T	1.18	0.82	70%	T	$5,062,500	$3,543,750	T	1.18	0.82
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			95%	--	$-	$-	T	1.18	1.12	95%	--	$-	$-	T	1.18	1.12
26	A - A	Design	Alignment A	Disposition of Dock at Lonestar (A)	If Central Valley Flood Protection Board files a law suit against the Lonestar site developer, the antiquated dock may be removed prior to construction, reducing project costs and schedule.			30%	O	($1,687,500)	($506,250)	--	0.00	0.00	70%	O	($1,687,500)	($1,181,250)	--	0.00	0.00
27	A - A	Environmental	Alignment A	Contamination at Lonestar Property (A, B)	During potential interim Riverfront Street connection (city's limited scope project) all substructures and contamination at Lonestar site may be removed prior to project construction.			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	--	$-	$-	--	0.00	0.00
31	A - A	Utilities & Agreements	Alignment A	Impacts to PG&E Gas Line (A)	Potential to impact PG&E Gas Line on the West Sacramento side of the proposed bridge. Currently, it appears that this pipeline will directly conflict with at least one of the in-water bridge foundations. Additionally, there will likely be impacts to the pipeline on the West Sacramento side of the river with this facility.			70%	T	$5,062,500	$3,543,750	T	18.80	13.00	70%	T	$5,062,500	$3,543,750	T	18.80	13.00
32	A - A	Design	Alignment A	Miller Park Road Access Concerns (A)				70%	T	$5,062,500	$3,543,750	--	0.00	0.00	70%	T	$5,062,500	$3,543,750	--	0.00	0.00
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			10%	T	$5,062,500	$506,250	T	3.53	0.35	10%	--	$-	$-	--	0.00	0.00
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			50%	O	($1,687,500)	($843,750)	O	1.18	0.59	70%	O	($1,687,500)	($1,181,250)	O	1.18	0.82
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
49	A - A	Design	Alignment A	Scope Change for 5th/15th Street Tie-In (A and B)	The alignment A tie-in to 15th St. may require additional right of way to be purchased. There could be additional costs and schedule impacts related to this additional acquisition. This includes all construction and support costs, as well as the reconfiguration of Riverfront St.			95%	T	$11,812,500	$11,221,875	T	18.80	18.00	95%	T	$11,812,500	$11,221,875	T	18.80	18.00
50	A - A	Environmental	Alignment A	Contamination at Chevron Site (A)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	95%	T	$8,437,500	$8,015,625	T	18.80	18.00
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			70%	T	$16,875,000	$11,812,500	T	18.80	13.00	50%	T	$16,875,000	$8,437,500	T	18.80	9.40

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			30%	T	$5,062,500	$1,518,750	--	0.00	0.00	30%	T	$5,062,500	$1,518,750	--	0.00	0.00
											$95,203,125							**$74,362,500**			

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
2	A - A	Right-of-Way	Alignment A	Acquisition of Chevron Property (A)	The acquisition strategy for the Chevron property would involve relocation, not closure. The study team anticipates that a five-year period will be required for all relocation activities after Record of Decision (ROD) is obtained.			Accept	There is no way to reduce the exposure of this risk.			A preliminary estimate was developed by comparing the costs of the Shell Property acquisition and making		
3	A - A	Permits & Approvals	Alignment A	Approval for Railroad Grade Crossing on Sacramento Side (A, B, C1 and D)	Four of the alignments will require permits for new or retrofitted railroad grade crossings on the Sacramento side of the river. There is potential for delays related to CPUC approval and possible additional mitigations that may be required.		A and B would require new crossings while C and D would be retrofit.	Mitigate	For alignments A and B, consultations with CPUC and the RR line operator should begin as soon as possible to reduce schedule impacts.					
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			Accept	The current in-water work window of 8 months should be sufficient to address any issues.					
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			Mitigate	Perform additional borings at bent locations. Adjust design as necessary, if practical.					
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			Accept	This is a minor risk and the required tree mitigation ratios will have to be met.					
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			Mitigate	Begin 408 consultations early. Begin process to establish location of theoretical levee prism and related improvements.					
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			Mitigate	Consider performing underwater investigations to identify potential obstructions.					
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			Accept						
12	A - A	Hydraulics	Alignment A	Impacts to West Sacramento Levee Improvements (A)	Alignment A is most significantly impacted by this risk. This is primarily related to the dock structure and how it interfaces with the levee structure. It is likely that alignment A will precipitate additional cost and schedule impacts related to addressing flood protection concerns in this area.			Avoid	Enter into negotiations with Cemex to repair and retrofit the dock to allow the wall to be left in place. West Sacramento would pay for these repairs.			Assume that $1 million in repairs would be required.		
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			Avoid	If NTP is at an inopportune time for nesting birds, consider an advance clearing and grubbing contract to remove bird nesting habitats prior to the nesting season.			Small contract administrative cost for advance clearing and grubbing at approximately $50,000.		
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			Accept	Complete wetlands inventory as soon as practical.					
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			Mitigate	Work proactively with cities and bicycle community to develop viable strategies for the bridge / bike path interface.					
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			Avoid	Do not pursue this option.					
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			Avoid	Pursue other strategies to divert traffic from Broadway Blvd. to X St.			Could include diverting traffic via Third St. which would require traffic improvements between $1 and $3 million for		
18	A - A	Geotechnical	Alignment A	Subsurface Obstructions (A)	There is the potential risk of encountering subsurface obstructions and/or archeological assets at the Lonestar site for alignment A, mainly related to the foundations of demolished structures.			Accept						
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			Mitigate	Potholing and/or GPR could be utilized to identify utilities during design.			Approximately $100,000.		
20	A - A	Right-of-Way	Alignment A	Acquisition of Lonestar Site (A, B)	This site is currently fully entitled for development as 'mixed use' (commercial and residential). Past experience has indicated that dealing with Lonestar is very challenging. It is likely that there will be cost and schedule impacts associated with acquiring this property.			Accept						

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			Mitigate	Engage in early consultations with USACE to determine the extent of impacts and possible mitigations.					
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			Mitigate	Perform early consultations with State Lands to identify issues as quickly as possible.					
24	A - A	Design	Alignment A	Collateral Impacts to Caltrans (A, B)	If alignment A is selected, and Riverfront street is redesigned, there is a potential for collateral impacts to Caltrans facilities, including a maintenance facility and the loop on-ramp for SR-50, on the West Sacramento side of the proposed bridge.			Accept	Begin planning early.					
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			Mitigate	Begin consultations with West Sacramento City Council early to reduce potential for delays.					
26	A - A	Design	Alignment A	Disposition of Dock at Lonestar (A)	If Central Valley Flood Protection Board files a law suit against the Lonestar site developer, the antiquated dock may be removed prior to construction, reducing project costs and schedule.			Enhance	Engage with Central Valley Flood Protection Board early and request an enforcement action.					
27	A - A	Environmental	Alignment A	Contamination at Lonestar Property (A, B)	During potential interim Riverfront Street connection (city's limited scope project) all substructures and contamination at Lonestar site may be removed prior to project construction.			Avoid	Expand scope of Riverfront Street Extension to perform necessary investigations.					
31	A - A	Utilities & Agreements	Alignment A	Impacts to PG&E Gas Line (A)	Potential to impact PG&E Gas Line on the West Sacramento side of the proposed bridge. Currently, it appears that this pipeline will directly conflict with at least one of the in-water bridge foundations. Additionally, there will likely be impacts to the pipeline on the West Sacramento side of the river with this facility.			Accept						
32	A - A	Design	Alignment A	Miller Park Road Access Concerns (A)				Accept	Begin early consultations with third parties including USACE, Central Valley Flood					
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			Avoid	West Sacramento to commence acquisition immediately following ROD to minimize potential of Port making an alternative decision.					
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			Accept						
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			Enhance	West Sacramento would continue its technical analysis of rail relocation, move into implementation, and seek funding.					
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			Accept						
49	A - A	Design	Alignment A	Scope Change for 5th/15th Street Tie-In (A and B)	The alignment A tie-in to 15th St. may require additional right of way to be purchased. There could be additional costs and schedule impacts related to this additional acquisition. This includes all construction and support costs, as well as the reconfiguration of Riverfront St.			Accept	Start design and acquisition activities as early as possible.					
50	A - A	Environmental	Alignment A	Contamination at Chevron Site (A)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			Accept	For alignment A, it is likely that full remediation will be required, therefore, the risk value for the pre-response condition would have to be accepted.			The study team noted that the Chevron site acquisition may not be able to follow the 'Shell model' (i.e. friendly acquisition), and that based on the infrastructure present, this would likely need to be a 'total take'.	Schedule delays associated with the Chevron property acquisition are likely to be as high as four years.	
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			Mitigate	Engage early and often to work with the public and apply lessons learned from the I Street Bridge.					
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			Accept						

Summary of Alignment B Risks


Broadway Bridge Alignment B - Cost Risk
Change in Bridge Aesthetics (ALL)
Traffic Improvements for 15th Street Tie-In (B)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination at Chevron Site (B)
Contamination of Phillips / State Lands Property (B)
Miller Park Road Access Concerns (B)
Connection of Miller Park Access Rd. to Broadway Bridge (B)
Collateral Impacts to Caltrans Facility (B)
Steel Prices (ALL)
4-Lane Option Impacts to Caltrans (ALL)
Impact to PG&E Gas Line (B)
Impacts to Bike Trails (ALL)
Geotechnical Conditions for Bridge Foundations (ALL)
Impacts to Designated Wetlands (ALL)
In-Water Work Windows (ALL)
Disposition of Small Parcel (B)
Acquisition of Lonestar Property (B)
Relocation of Overhead Utilities (ALL)
Relocation of West Side Rail (ALL)
Unknown utilities (ALL)
Tree Removal (ALL)
Change in Disposition of Shell Property (ALL)
Hydraulic Mitigation Measures (ALL)
Contamination at Bridge Foundations (ALL)
Subsurface Obstructions (B, C1, C3, D)
Impacts to Marine Species (ALL)
Underwater Obstructions (ALL)
$11,812,500
$11,221,875
$8,268,750
$8,015,625
$8,015,625
$3,543,750
$3,543,750
$2,531,250
$2,531,250
$2,531,250
$2,531,250
$1,603,125
$1,518,750
$1,518,750
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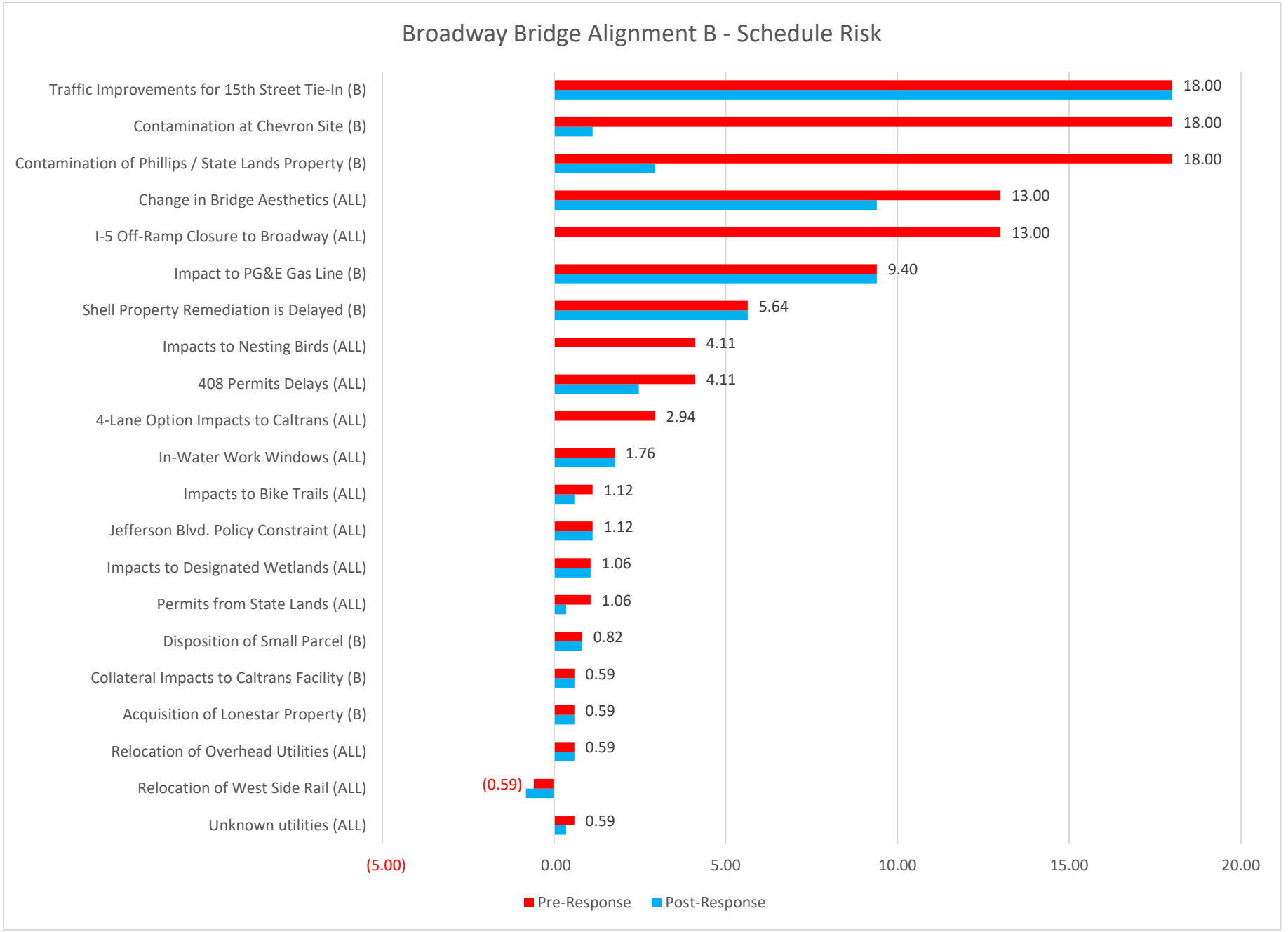
Pre-Response
Post-Response


Broadway Bridge Alignment B - Schedule Risk
Traffic Improvements for 15th Street Tie-In (B)
Contamination at Chevron Site (B)
Contamination of Phillips / State Lands Property (B)
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Impact to PG&E Gas Line (B)
Shell Property Remediation is Delayed (B)
Impacts to Nesting Birds (ALL)
408 Permits Delays (ALL)
4-Lane Option Impacts to Caltrans (ALL)
In-Water Work Windows (ALL)
Impacts to Bike Trails (ALL)
Jefferson Blvd. Policy Constraint (ALL)
Impacts to Designated Wetlands (ALL)
Permits from State Lands (ALL)
Disposition of Small Parcel (B)
Collateral Impacts to Caltrans Facility (B)
Acquisition of Lonestar Property (B)
Relocation of Overhead Utilities (ALL)
Relocation of West Side Rail (ALL)
Unknown utilities (ALL)
18.00
18.00
18.00
13.00
13.00
9.40
5.64
4.11
4.11
2.94
1.76
1.12
1.12
1.06
1.06
0.82
0.59
0.59
0.59
(0.59)
0.59
(5.00)
0.00
5.00
10.00
15.00
20.00
Pre-Response
Post-Response

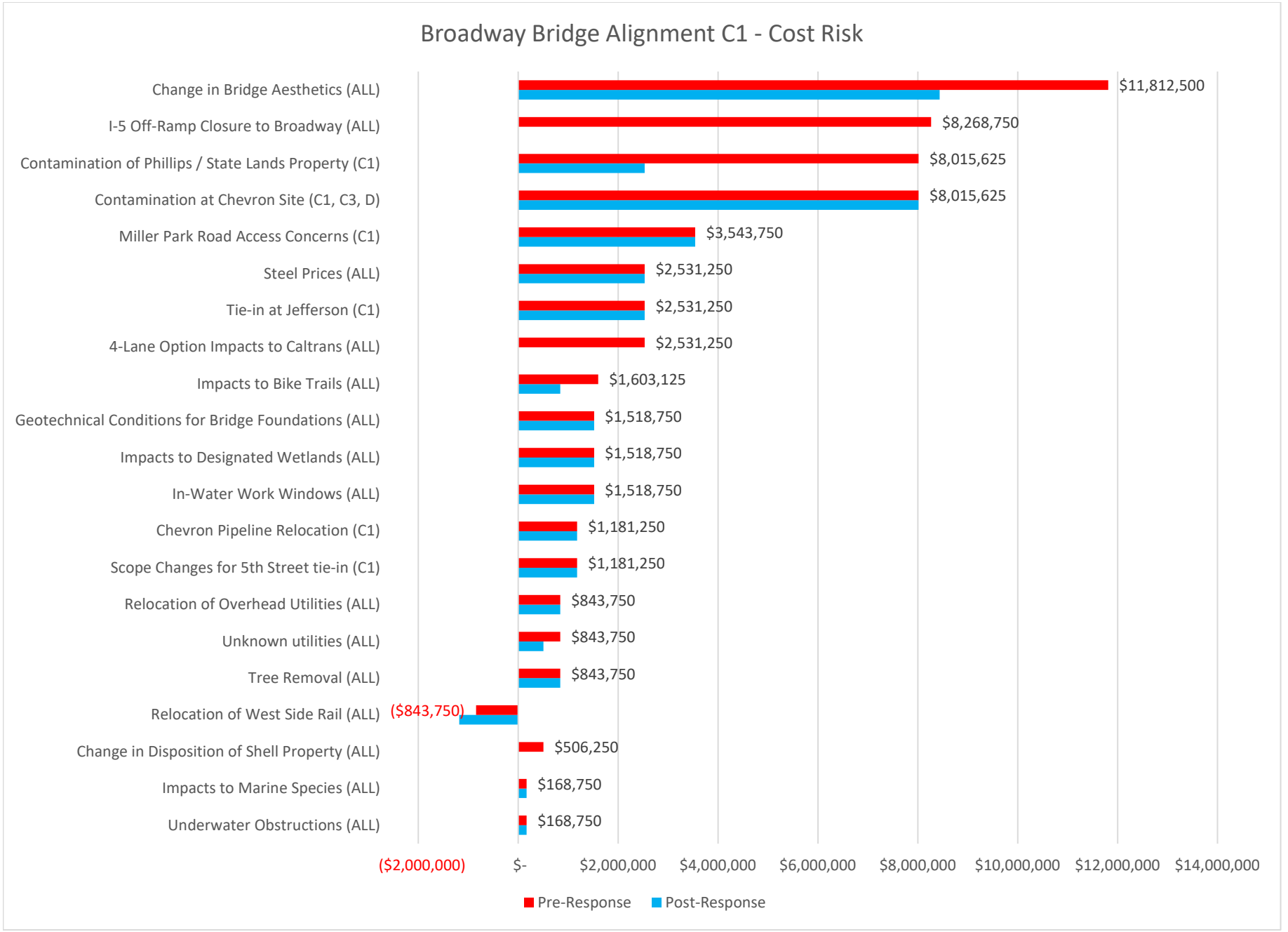
Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	T	$5,062,500	$1,518,750	T	5.88	1.76
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			30%	T	$1,687,500	$506,250	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
6	A - A	Utilities & Agreements	Alignment B	Impact to PG&E Gas Line (B)	It is possible that the PG&E pipeline could conflict with the west abutment.			50%	T	$5,062,500	$2,531,250	T	18.80	9.40	50%	T	$5,062,500	$2,531,250	T	18.80	9.40
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	T	3.53	2.47
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			30%	T	$5,062,500	$1,518,750	T	3.53	1.06	30%	T	$5,062,500	$1,518,750	T	3.53	1.06
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			95%	T	$1,687,500	$1,603,125	T	1.18	1.12	50%	T	$1,687,500	$843,750	T	1.18	0.59
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			50%	T	$5,062,500	$2,531,250	T	5.88	2.94	50%	--	$-	$-	--	0.00	0.00
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			70%	T	$11,812,500	$8,268,750	T	18.80	13.00	70%	--	$-	$-	--	0.00	0.00
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			50%	T	$1,687,500	$843,750	T	1.18	0.59	30%	T	$1,687,500	$506,250	T	1.18	0.35
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			30%	T	$1,687,500	$506,250	--	0.00	0.00	30%	T	$1,687,500	$506,250	--	0.00	0.00
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			30%	--	$-	$-	T	3.53	1.06	30%	--	$-	$-	T	1.18	0.35
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			95%	--	$-	$-	T	1.18	1.12	95%	--	$-	$-	T	1.18	1.12
28	A - A	Right-of-Way	Alignment B	Disposition of Small Parcel (B)	This parcel is owned by Phillips 66 according to the assessors records (between the railroad and the river). Because of its location, however, it is likely affected by State Lands rules. This will have a small cost and schedule impact related to acquisition.			70%	T	$1,687,500	$1,181,250	T	1.18	0.82	70%	T	$1,687,500	$1,181,250	T	1.18	0.82
29	A - A	Design	Alignment B	Connection of Miller Park Access Rd. to Broadway Bridge (B)	The connection of Miller Park access road to the proposed bridge (on the Sacramento side) is currently undefined. This may increase hydraulic concerns related to additional fill in the floodplain.			70%	T	$5,062,500	$3,543,750	--	0.00	0.00	70%	T	$5,062,500	$3,543,750	--	0.00	0.00
30	A - A	Environmental	Alignment B	Shell Property Remediation is Delayed (B)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years.			30%	--	$-	$-	T	18.80	5.64	30%	--	$-	$-	T	18.80	5.64

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			10%	T	$5,062,500	$506,250	T	3.53	0.35	10%	--	$-	$-	--	0.00	0.00
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			50%	O	($1,687,500)	($843,750)	O	1.18	0.59	70%	O	($1,687,500)	($1,181,250)	O	1.18	0.82
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
51	A - A	Geotechnical	Alignment B	Subsurface Obstructions (B, C1, C3, D)	There is a potential risk of encountering subsurface obstructions and/or archeological assets at the Lonestar site for alignment A, mainly related to the foundations of demolished structures.			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
52	A - A	Right-of-Way	Alignment B	Acquisition of Lonestar Property (B)	This site is currently fully entitled for development as 'mixed use' (commercial and residential).			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
55	A - A	Design	Alignment B	Collateral Impacts to Caltrans Facility (B)	If alignment B is selected, and Riverfront street is redesigned, there is a potential for collateral impacts to Caltrans facilities on the West Sacramento side of the proposed bridge.			50%	T	$5,062,500	$2,531,250	T	1.18	0.59	50%	T	$5,062,500	$2,531,250	T	1.18	0.59
58	A - A	Design	Alignment B	Miller Park Road Access Concerns (B)				70%	T	$5,062,500	$3,543,750	--	0.00	0.00	70%	T	$5,062,500	$3,543,750	--	0.00	0.00
66	A - A	Environmental	Alignment B	Contamination of Phillips / State Lands Property (B)	There is significant diesel and gas contamination at this site.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	50%	T	$5,062,500	$2,531,250	T	5.88	2.94
73	A - A	Design	Alignment B	Traffic Improvements for 15th Street Tie-In (B)	May need to purchase additional right-of-way for 15th Street and Riverfront Street.			95%	T	$11,812,500	$11,221,875	T	18.80	18.00	95%	T	$11,812,500	$11,221,875	T	18.80	18.00
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			70%	T	$16,875,000	$11,812,500	T	18.80	13.00	50%	T	$16,875,000	$8,437,500	T	18.80	9.40
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			30%	T	$5,062,500	$1,518,750	--	0.00	0.00	30%	T	$5,062,500	$1,518,750	--	0.00	0.00
77	A - A	Environmental	Alignment B	Contamination at Chevron Site (B)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	95%	T	$1,687,500	$1,603,125	T	1.18	1.12
											$76,443,750							**$48,093,750**			

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			Accept	The current in-water work window of 8 months should be sufficient to address any issues.					
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			Mitigate	Perform additional borings at bent locations. Adjust design as necessary, if practical.					
6	A - A	Utilities & Agreements	Alignment B	Impact to PG&E Gas Line (B)	It is possible that the PG&E pipeline could conflict with the west abutment.									
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			Accept	This is a minor risk and the required tree mitigation ratios will have to be met.					
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			Mitigate	Begin 408 consultations early. Begin process to establish location of theoretical levee prism and related improvements.					
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			Mitigate	Consider performing underwater investigations to identify potential obstructions.					
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			Accept						
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			Avoid	If NTP is at an inopportune time for nesting birds, consider an advance clearing and grubbing contract to remove bird nesting habitats prior to the nesting season.			Small contract administrative cost for advance clearing and grubbing at approximately $50,000.		
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			Accept	Complete wetlands inventory as soon as practical.					
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			Mitigate	Work proactively with cities and bicycle community to develop viable strategies for the bridge / bike path interface.					
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			Avoid	Do not pursue this option.					
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			Avoid	Pursue other strategies to divert traffic from Broadway Blvd. to X St.			Could include diverting traffic via Third St. which would require traffic improvements between $1 and $3 million for construction and right of way costs.		
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			Mitigate	Potholing and/or GPR could be utilized to identify utilities during design.			Approximately $100,000.		
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			Mitigate	Engage in early consultations with USACE to determine the extent of impacts and possible mitigations.					
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			Mitigate	Perform early consultations with State Lands to identify issues as quickly as possible.					
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			Mitigate	Begin consultations with West Sacramento City Council early to reduce potential for delays.					
28	A - A	Right-of-Way	Alignment B	Disposition of Small Parcel (B)	This parcel is owned by Phillips 66 according to the assessors records (between the railroad and the river). Because of its location, however, it is likely affected by State Lands rules. This will have a small cost and schedule impact related to acquisition.			Accept				The estimated acquisition cost would conservatively be $2.25 million.		
29	A - A	Design	Alignment B	Connection of Miller Park Access Rd. to Broadway Bridge (B)	The connection of Miller Park access road to the proposed bridge (on the Sacramento side) is currently undefined. This may increase hydraulic concerns related to additional fill in the floodplain.			Accept	Begin early consultations with third parties including USACE, Central Valley Flood Protection Board, and Sacramento Public Works.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
30	A - A	Environmental	Alignment B	Shell Property Remediation is Delayed (B)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years.			Accept/Mitigate	Provide a monetary incentive to Shell to accelerate remediation.					
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			Avoid	West Sacramento to commence acquisition immediately following ROD to minimize potential of Port making an alternative decision.					
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			Accept						
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			Enhance	West Sacramento would continue its technical analysis of rail relocation, move into implementation, and seek funding.					
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			Accept						
51	A - A	Geotechnical	Alignment B	Subsurface Obstructions (B, C1, C3, D)	There is a potential risk of encountering subsurface obstructions and/or archeological assets at the Lonestar site for alignment A, mainly related to the foundations of demolished structures.			Accept						
52	A - A	Right-of-Way	Alignment B	Acquisition of Lonestar Property (B)	This site is currently fully entitled for development as 'mixed use' (commercial and residential).			Accept						
55	A - A	Design	Alignment B	Collateral Impacts to Caltrans Facility (B)	If alignment B is selected, and Riverfront street is redesigned, there is a potential for collateral impacts to Caltrans facilities on the West Sacramento side of the proposed bridge.			Accept						
58	A - A	Design	Alignment B	Miller Park Road Access Concerns (B)				Accept	Begin early consultations with third parties including USACE, Central Valley Flood Protection Board, and Sacramento Public Works.					
66	A - A	Environmental	Alignment B	Contamination of Phillips / State Lands Property (B)	There is significant diesel and gas contamination at this site.			Mitigate	The current horizontal curves for the roadway on the east side of Broadway Blvd. are designed as 55 mph curves. The geometry could be modified to less than 55 mph (45 or 35 mph) which may allow the alignment to miss the contaminated areas. The City of Sacramento could pursue a Gatto action against Chevron that would accelerate and compel clean-up.					
73	A - A	Design	Alignment B	Traffic Improvements for 15th Street Tie-In (B)	May need to purchase additional right-of-way for 15th Street and Riverfront Street.			Accept						
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			Mitigate	Engage early and often to work with the public and apply lessons learned from the I Street Bridge.					
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			Accept						
77	A - A	Environmental	Alignment B	Contamination at Chevron Site (B)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			Mitigate	Mitigation during construction to contain contaminated groundwater could be pursued (such as driving piles).					

Summary of Alignment C1 Risks


Broadway Bridge Alignment C1 - Cost Risk
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination of Phillips / State Lands Property (C1)
Contamination at Chevron Site (C1, C3, D)
Miller Park Road Access Concerns (C1)
Steel Prices (ALL)
Tie-in at Jefferson (C1)
4-Lane Option Impacts to Caltrans (ALL)
Impacts to Bike Trails (ALL)
Geotechnical Conditions for Bridge Foundations (ALL)
Impacts to Designated Wetlands (ALL)
In-Water Work Windows (ALL)
Chevron Pipeline Relocation (C1)
Scope Changes for 5th Street tie-in (C1)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Tree Removal (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Impacts to Marine Species (ALL)
Underwater Obstructions (ALL)
$11,812,500
$8,268,750
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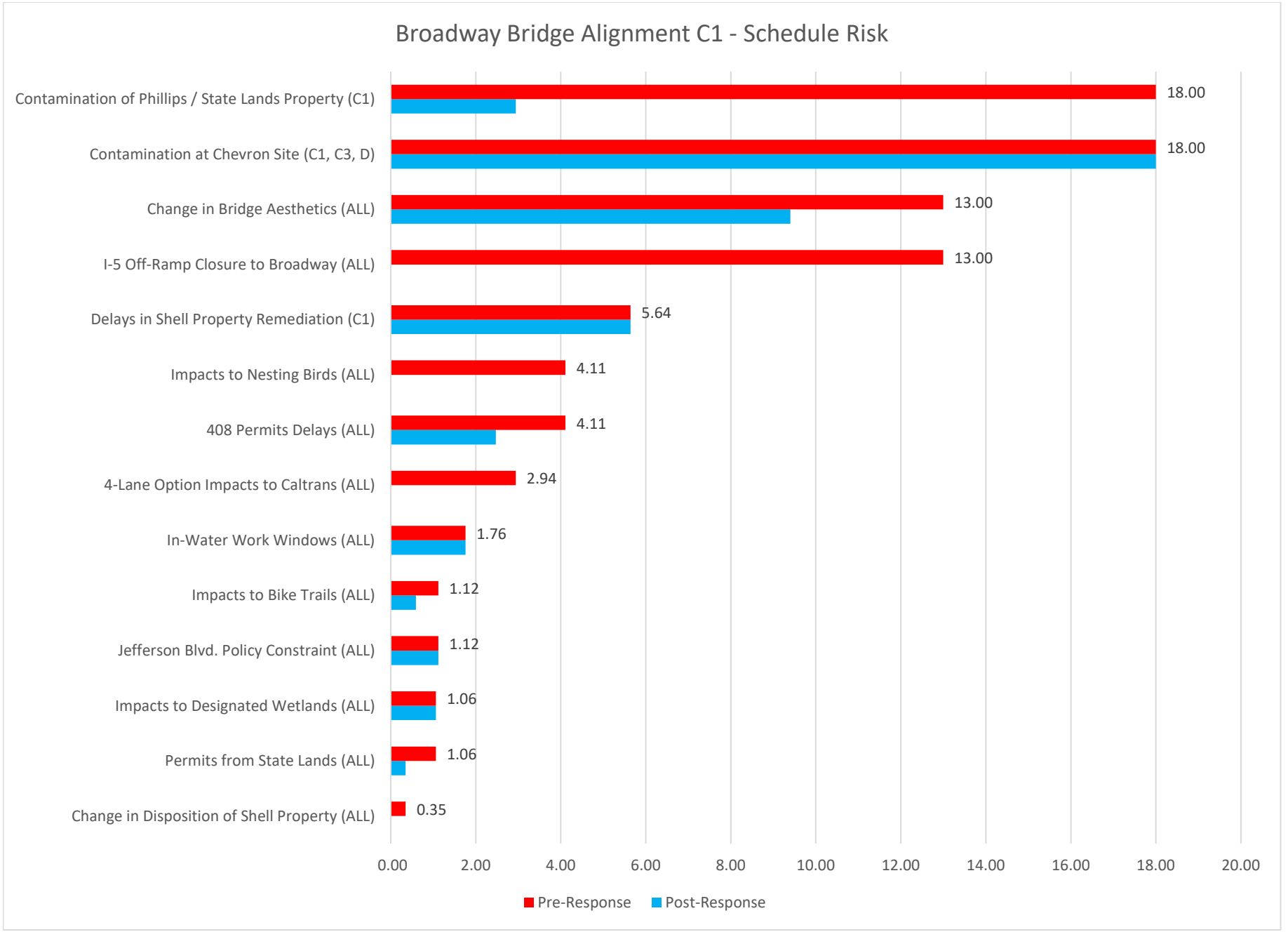
Pre-Response
Post-Response


Broadway Bridge Alignment C1 - Schedule Risk
Contamination of Phillips / State Lands Property (C1)
18.00
Contamination at Chevron Site (C1, C3, D)
18.00
Change in Bridge Aesthetics (ALL)
13.00
I-5 Off-Ramp Closure to Broadway (ALL)
13.00
Delays in Shell Property Remediation (C1)
5.64
Impacts to Nesting Birds (ALL)
4.11
408 Permits Delays (ALL)
4.11
4-Lane Option Impacts to Caltrans (ALL)
2.94
In-Water Work Windows (ALL)
1.76
Impacts to Bike Trails (ALL)
1.12
Jefferson Blvd. Policy Constraint (ALL)
1.12
Impacts to Designated Wetlands (ALL)
1.06
Permits from State Lands (ALL)
1.06
Change in Disposition of Shell Property (ALL)
0.35
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
Pre-Response
Post-Response

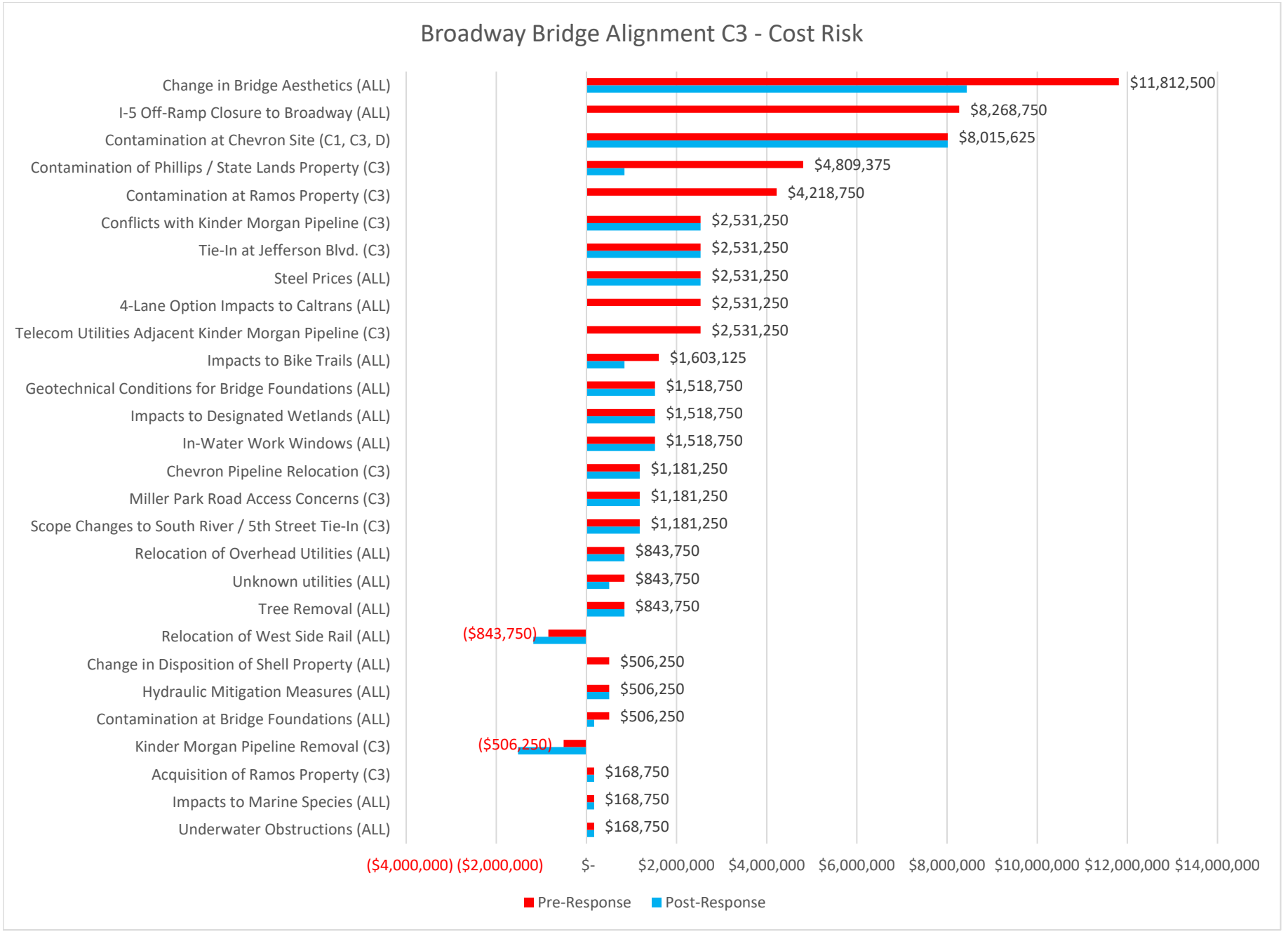
Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	95%	T	$8,437,500	$8,015,625	T	18.80	18.00
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	T	$5,062,500	$1,518,750	T	5.88	1.76
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			30%	T	$1,687,500	$506,250	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	T	3.53	2.47
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule.			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			30%	T	$5,062,500	$1,518,750	T	3.53	1.06	30%	T	$5,062,500	$1,518,750	T	3.53	1.06
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			95%	T	$1,687,500	$1,603,125	T	1.18	1.12	50%	T	$1,687,500	$843,750	T	1.18	0.59
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			50%	T	$5,062,500	$2,531,250	T	5.88	2.94	50%	--	$-	$-	--	0.00	0.00
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			70%	T	$11,812,500	$8,268,750	T	18.80	13.00	70%	--	$-	$-	--	0.00	0.00
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			50%	T	$1,687,500	$843,750	T	1.18	0.59	30%	T	$1,687,500	$506,250	T	1.18	0.35
21	A - A	Design	Alignment C1	Scope Changes for 5th Street tie-in (C1)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			30%	T	$1,687,500	$506,250	--	0.00	0.00	30%	T	$1,687,500	$506,250	--	0.00	0.00

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			30%	--	$-	$-	T	3.53	1.06	30%	--	$-	$-	T	1.18	0.35
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			95%	--	$-	$-	T	1.18	1.12	95%	--	$-	$-	T	1.18	1.12
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			10%	T	$5,062,500	$506,250	T	3.53	0.35	10%	--	$-	$-	--	0.00	0.00
34	A - A	Design	Alignment C1	Tie-in at Jefferson (C1)	C and D options require the acquisition of additional right of way to make the connection to Jefferson. Significant associated right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse property.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			50%	O	($1,687,500)	($843,750)	O	(1.18)	(0.59)	70%	O	($1,687,500)	($1,181,250)	O	(1.18)	(0.82)
46	A - A	Environmental	Alignment C1	Chevron Pipeline Relocation (C1)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
56	A - A	Environmental	Alignment C1	Delays in Shell Property Remediation (C1)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years. There is a potential for delays of the Shell property remediation that could extend past the project NTP.			30%	--	$-	$-	T	18.80	5.64	30%	--	$-	$-	T	18.80	5.64
59	A - A	Design	Alignment C1	Miller Park Road Access Concerns (C1)				70%	T	$5,062,500	$3,543,750	--	0.00	0.00	70%	T	$5,062,500	$3,543,750	--	0.00	0.00
67	A - A	Environmental	Alignment C1	Contamination of Phillips / State Lands Property (C1)	There is significant diesel and gas contamination at this site.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	50%	T	$5,062,500	$2,531,250	T	5.88	2.94
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			70%	T	$16,875,000	$11,812,500	T	18.80	13.00	50%	T	$16,875,000	$8,437,500	T	18.80	9.40
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			30%	T	$5,062,500	$1,518,750	--	0.00	0.00	30%	T	$5,062,500	$1,518,750	--	0.00	0.00
											$59,315,625							**$37,378,125**			

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			Mitigate	Cap the existing roadway area wells, install new monitoring wells, and relocate or abandon impacted monitoring wells.					
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			Accept	The current in-water work window of 8 months should be sufficient to address any issues.					
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			Mitigate	Perform additional borings at bent locations. Adjust design as necessary, if practical.					
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			Accept	This is a minor risk and the required tree mitigation ratios will have to be met.					
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			Mitigate	Begin 408 consultations early. Begin process to establish location of theoretical levee prism and related improvements.					
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			Mitigate	Consider performing underwater investigations to identify potential obstructions.					
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule.			Accept						
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			Avoid	If NTP is at an inopportune time for nesting birds, consider an advance clearing and grubbing contract to remove bird nesting habitats prior to the nesting season.			Small contract administrative cost for advance clearing and grubbing at approximately $50,000.		
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			Accept	Complete wetlands inventory as soon as practical.					
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			Mitigate	Work proactively with cities and bicycle community to develop viable strategies for the bridge / bike path interface.					
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			Avoid	Do not pursue this option.					
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			Avoid	Pursue other strategies to divert traffic from Broadway Blvd. to X St.			Could include diverting traffic via Third St. which would require traffic improvements between $1 and $3 million for construction and right of		
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			Mitigate	Potholing and/or GPR could be utilized to identify utilities during design.			Approximately $100,000.		
21	A - A	Design	Alignment C1	Scope Changes for 5th Street tie-in (C1)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			Accept						
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			Mitigate	Engage in early consultations with USACE to determine the extent of impacts and possible mitigations.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			Mitigate	Perform early consultations with State Lands to identify issues as quickly as possible.					
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			Mitigate	Begin consultations with West Sacramento City Council early to reduce potential for delays.					
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			Avoid	West Sacramento to commence acquisition immediately following ROD to minimize potential of Port making an alternative decision.					
34	A - A	Design	Alignment C1	Tie-in at Jefferson (C1)	C and D options require the acquisition of additional right of way to make the connection to Jefferson. Significant associated right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse property.			Accept						
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			Accept						
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			Enhance	West Sacramento would continue its technical analysis of rail relocation, move into implementation, and seek funding.					
46	A - A	Environmental	Alignment C1	Chevron Pipeline Relocation (C1)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			Accept						
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			Accept						
56	A - A	Environmental	Alignment C1	Delays in Shell Property Remediation (C1)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years. There is a potential for delays of the Shell property remediation that could extend past the project NTP.			Accept	Provide a monetary incentive to Shell to accelerate remediation.					
59	A - A	Design	Alignment C1	Miller Park Road Access Concerns (C1)				Accept	Begin early consultations with third parties including USACE, Central Valley Flood Protection Board, and Sacramento Public Works.					
67	A - A	Environmental	Alignment C1	Contamination of Phillips / State Lands Property (C1)	There is significant diesel and gas contamination at this site.			Mitigate	The current horizontal curves for the roadway on the east side of Broadway Blvd. are designed as 55 mph curves. The geometry could be modified to less than 55 mph (45 or 35 mph) which may allow the alignment to miss the contaminated areas. The City of Sacramento could pursue a Gatto action against Chevron that would accelerate and compel clean-up.					
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			Mitigate	Engage early and often to work with the public and apply lessons learned from the I Street Bridge.					
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			Accept						

Summary of Alignment C3 Risks


Broadway Bridge Alignment C3 - Cost Risk
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination at Chevron Site (C1, C3, D)
Contamination of Phillips / State Lands Property (C3)
Contamination at Ramos Property (C3)
Conflicts with Kinder Morgan Pipeline (C3)
Tie-In at Jefferson Blvd. (C3)
Steel Prices (ALL)
4-Lane Option Impacts to Caltrans (ALL)
Telecom Utilities Adjacent Kinder Morgan Pipeline (C3)
Impacts to Bike Trails (ALL)
Geotechnical Conditions for Bridge Foundations (ALL)
Impacts to Designated Wetlands (ALL)
In-Water Work Windows (ALL)
Chevron Pipeline Relocation (C3)
Miller Park Road Access Concerns (C3)
Scope Changes to South River / 5th Street Tie-In (C3)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Tree Removal (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Hydraulic Mitigation Measures (ALL)
Contamination at Bridge Foundations (ALL)
Kinder Morgan Pipeline Removal (C3)
Acquisition of Ramos Property (C3)
Impacts to Marine Species (ALL)
Underwater Obstructions (ALL)
$11,812,500
$8,268,750
$8,015,625
$4,809,375
$4,218,750
$2,531,250
$2,531,250
$2,531,250
$2,531,250
$2,531,250
$1,603,125
$1,518,750
$1,518,750
$1,518,750
$1,181,250
$1,181,250
$1,181,250
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$843,750
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($506,250)
$168,750
$168,750
$168,750
($4,000,000)
($2,000,000)
$-
$2,000,000
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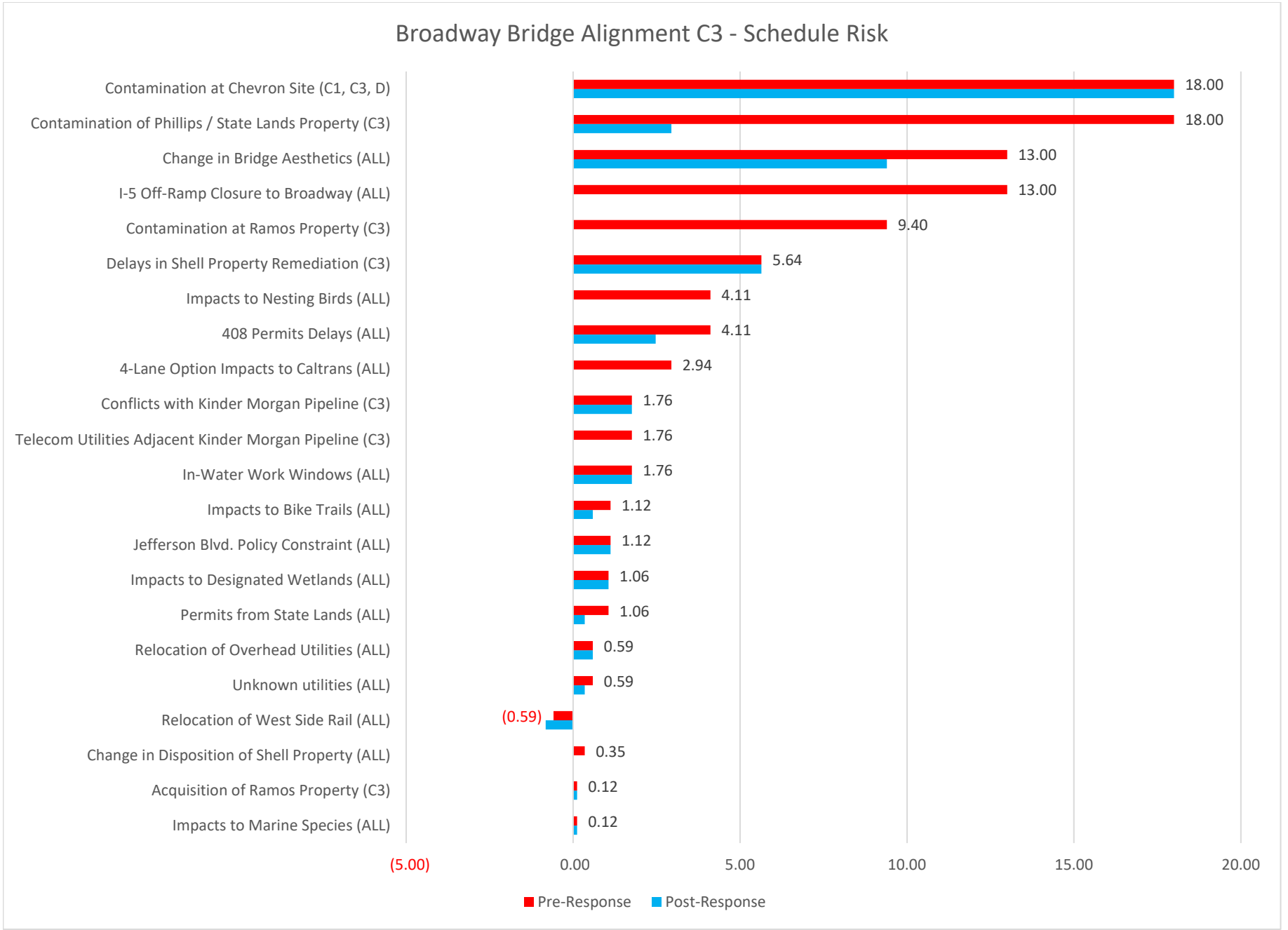
$12,000,000
$14,000,000
Pre-Response
Post-Response


Broadway Bridge Alignment C3 - Schedule Risk
Contamination at Chevron Site (C1, C3, D)
Contamination of Phillips / State Lands Property (C3)
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination at Ramos Property (C3)
Delays in Shell Property Remediation (C3)
Impacts to Nesting Birds (ALL)
408 Permits Delays (ALL)
4-Lane Option Impacts to Caltrans (ALL)
Conflicts with Kinder Morgan Pipeline (C3)
Telecom Utilities Adjacent Kinder Morgan Pipeline (C3)
In-Water Work Windows (ALL)
Impacts to Bike Trails (ALL)
Jefferson Blvd. Policy Constraint (ALL)
Impacts to Designated Wetlands (ALL)
Permits from State Lands (ALL)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Acquisition of Ramos Property (C3)
Impacts to Marine Species (ALL)
18.00
18.00
13.00
13.00
9.40
5.64
4.11
4.11
2.94
1.76
1.76
1.76
1.12
1.12
1.06
1.06
0.59
0.59
(0.59)
0.35
0.12
0.12
(5.00)
0.00
5.00
10.00
15.00
20.00
Pre-Response
Post-Response

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	95%	T	$8,437,500	$8,015,625	T	18.80	18.00
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	T	$5,062,500	$1,518,750	T	5.88	1.76
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			30%	T	$1,687,500	$506,250	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	T	3.53	2.47
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule.			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			30%	T	$5,062,500	$1,518,750	T	3.53	1.06	30%	T	$5,062,500	$1,518,750	T	3.53	1.06
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			95%	T	$1,687,500	$1,603,125	T	1.18	1.12	50%	T	$1,687,500	$843,750	T	1.18	0.59
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			50%	T	$5,062,500	$2,531,250	T	5.88	2.94	50%	--	$-	$-	--	0.00	0.00
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			70%	T	$11,812,500	$8,268,750	T	18.80	13.00	70%	--	$-	$-	--	0.00	0.00
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			50%	T	$1,687,500	$843,750	T	1.18	0.59	30%	T	$1,687,500	$506,250	T	1.18	0.35
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			30%	T	$1,687,500	$506,250	--	0.00	0.00	30%	T	$1,687,500	$506,250	--	0.00	0.00
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			30%	--	$-	$-	T	3.53	1.06	30%	--	$-	$-	T	1.18	0.35
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			95%	--	$-	$-	T	1.18	1.12	95%	--	$-	$-	T	1.18	1.12

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			10%	T	$5,062,500	$506,250	T	3.53	0.35	10%	--	$-	$-	--	0.00	0.00
35	A - A	Design	Alignment C3	Kinder Morgan Pipeline Removal (C3)	It is possible that the Kinder Morgan pipeline could be removed or abandoned prior to construction of the project.			10%	O	($5,062,500)	($506,250)	--	0.00	0.00	30%	O	($5,062,500)	($1,518,750)	--	0.00	0.00
36	A - A	Right-of-Way	Alignment C3	Acquisition of Ramos Property (C3)	There could be higher than anticipated acquisition and relocation costs related to the purchase of the Ramos property.			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
37	A - A	Utilities & Agreements	Alignment C3	Telecom Utilities Adjacent Kinder Morgan Pipeline (C3)	The telecom facility (an old, re-purposed Kinder Morgan pipeline) adjacent to the existing Kinder Morgan pipeline may be impacted.			50%	T	$5,062,500	$2,531,250	T	3.53	1.76	50%	--	$-	$-	--	0.00	0.00
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			50%	O	($1,687,500)	($843,750)	O	(1.18)	(0.59)	70%	O	($1,687,500)	($1,181,250)	O	(1.18)	(0.82)
47	A - A	Environmental	Alignment C3	Contamination at Ramos Property (C3)	Due to the existence of a wharf at this site, there are likely contaminants in the water. Remediation of the Ramos site will presumably be more expensive than the Chevron and Shell sites, as there are metal contaminants at this site.			50%	T	$8,437,500	$4,218,750	T	18.80	9.40	50%	--	$-	$-	--	0.00	0.00
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
54	A - A	Design	Alignment C3	Scope Changes to South River / 5th Street Tie-In (C3)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
57	A - A	Environmental	Alignment C3	Delays in Shell Property Remediation (C3)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years.			30%	--	$-	$-	T	18.80	5.64	30%	--	$-	$-	T	18.80	5.64
60	A - A	Design	Alignment C3	Miller Park Road Access Concerns (C3)				70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
62	A - A	-	Alignment C3	Tie-In at Jefferson Blvd. (C3)	Requires the acquisition of additional right of way to make the connection to Jefferson. Significant associated right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse facility.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
64	A - A	Utilities & Agreements	Alignment C3	Conflicts with Kinder Morgan Pipeline (C3)	Alignment C3 was designed to avoid the Kinder Morgan pipeline by locating it to the south of the pipeline for most of the pipeline route, however, on the Sacramento side there are concerns that the bridge abutment would conflict with the pipeline.			30%	T	$8,437,500	$2,531,250	T	5.88	1.76	30%	T	$8,437,500	$2,531,250	T	5.88	1.76
68	A - A	Environmental	Alignment C3	Contamination of Phillips / State Lands Property (C3)	There is significant diesel and gas contamination at this site.			95%	T	$5,062,500	$4,809,375	T	18.80	18.00	50%	T	$1,687,500	$843,750	T	5.88	2.94
70	A - A	Environmental	Alignment C3	Chevron Pipeline Relocation (C3)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00

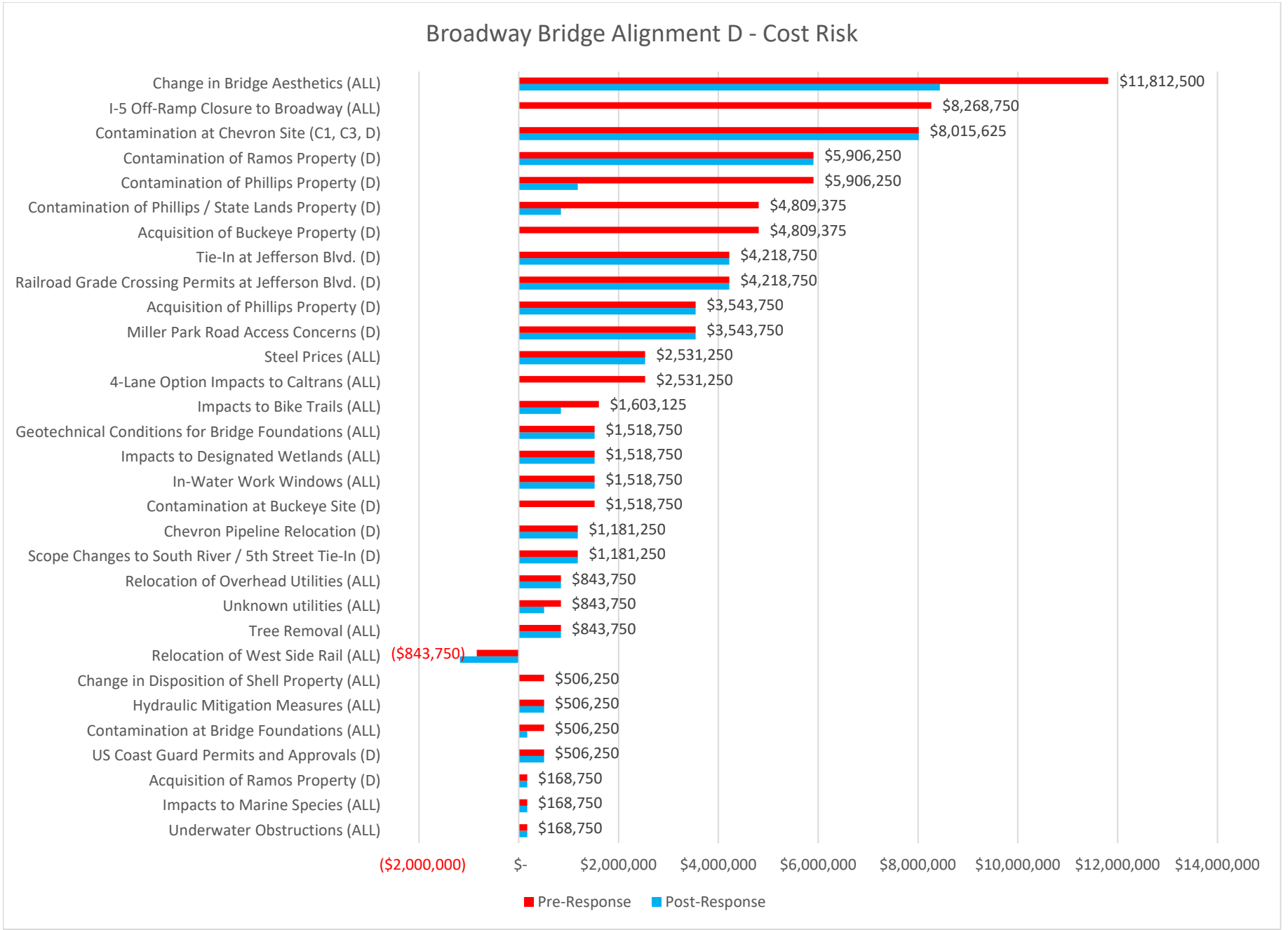
Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			70%	T	$16,875,000	$11,812,500	T	18.80	13.00	50%	T	$16,875,000	$8,437,500	T	18.80	9.40
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			30%	T	$5,062,500	$1,518,750	--	0.00	0.00	30%	T	$5,062,500	$1,518,750	--	0.00	0.00
											$62,690,625							**$34,509,375**			

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			Mitigate	Cap the existing roadway area wells, install new monitoring wells, and relocate or abandon impacted monitoring wells.					
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			Accept	The current in-water work window of 8 months should be sufficient to address any issues.					
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			Mitigate	Perform additional borings at bent locations. Adjust design as necessary, if practical.					
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			Accept	This is a minor risk and the required tree mitigation ratios will have to be met.					
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			Mitigate	Begin 408 consultations early. Begin process to establish location of theoretical levee prism and related improvements.					
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			Mitigate	Consider performing underwater investigations to identify potential obstructions.					
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule.			Accept						
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			Avoid	If NTP is at an inopportune time for nesting birds, consider an advance clearing and grubbing contract to remove bird nesting habitats prior to the nesting season.			Small contract administrative cost for advance clearing and grubbing at approximately $50,000.		
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			Accept	Complete wetlands inventory as soon as practical.					
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			Mitigate	Work proactively with cities and bicycle community to develop viable strategies for the bridge / bike path interface.					
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			Avoid	Do not pursue this option.					
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			Avoid	Pursue other strategies to divert traffic from Broadway Blvd. to X St.			Could include diverting traffic via Third St. which would require traffic improvements between $1 and $3 million for		
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			Mitigate	Potholing and/or GPR could be utilized to identify utilities during design.			Approximately $100,000.		
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			Mitigate	Engage in early consultations with USACE to determine the extent of impacts and possible mitigations.					
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			Mitigate	Perform early consultations with State Lands to identify issues as quickly as possible.					
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			Mitigate	Begin consultations with West Sacramento City Council early to reduce potential for delays.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			Avoid	West Sacramento to commence acquisition immediately following ROD to minimize potential of Port making an alternative decision.					
35	A - A	Design	Alignment C3	Kinder Morgan Pipeline Removal (C3)	It is possible that the Kinder Morgan pipeline could be removed or abandoned prior to construction of the project.			Enhance	Further research covenants and agreements related to easements and relocation requirements.					
36	A - A	Right-of-Way	Alignment C3	Acquisition of Ramos Property (C3)	There could be higher than anticipated acquisition and relocation costs related to the purchase of the Ramos property.			Accept						
37	A - A	Utilities & Agreements	Alignment C3	Telecom Utilities Adjacent Kinder Morgan Pipeline (C3)	The telecom facility (an old, re-purposed Kinder Morgan pipeline) adjacent to the existing Kinder Morgan pipeline may be impacted.			Avoid	Further refine C3 alignment to miss utilities. Further research covenants and agreements related to easements and relocation requirements.					
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			Accept						
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			Enhance	West Sacramento would continue its technical analysis of rail relocation, move into implementation, and seek funding.					
47	A - A	Environmental	Alignment C3	Contamination at Ramos Property (C3)	Due to the existence of a wharf at this site, there are likely contaminants in the water. Remediation of the Ramos site will presumably be more expensive than the Chevron and Shell sites, as there are metal contaminants at this site.			Avoid	This risk could be avoided by shifting alignment C3 north into the Shell property.					
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			Accept						
54	A - A	Design	Alignment C3	Scope Changes to South River / 5th Street Tie-In (C3)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			Accept						
57	A - A	Environmental	Alignment C3	Delays in Shell Property Remediation (C3)	Benzine contamination is the primary issue at the Shell site. Water contamination remediation will require four years.			Accept	Provide a monetary incentive to Shell to accelerate remediation.					
60	A - A	Design	Alignment C3	Miller Park Road Access Concerns (C3)				Accept	Begin early consultations with third parties including USACE, Central Valley Flood Protection Board, and Sacramento Public Works.					
62	A - A	-	Alignment C3	Tie-In at Jefferson Blvd. (C3)	Requires the acquisition of additional right of way to make the connection to Jefferson. Significant associated right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse facility.			Accept						
64	A - A	Utilities & Agreements	Alignment C3	Conflicts with Kinder Morgan Pipeline (C3)	Alignment C3 was designed to avoid the Kinder Morgan pipeline by locating it to the south of the pipeline for most of the pipeline route, however, on the Sacramento side there are concerns that the bridge abutment would conflict with the pipeline.			Mitigate	A potential mitigation for this conflict would be to shift the C3 alignment on the Sacramento side further south. However, by doing this, a new risk would occur related to the acquisition of the small parcel of land with the two Phillips tanks.					
68	A - A	Environmental	Alignment C3	Contamination of Phillips / State Lands Property (C3)	There is significant diesel and gas contamination at this site.			Mitigate	The current horizontal curves for the roadway on the east side of Broadway Blvd. are designed as 55 mph curves. The geometry could be modified to less than 55 mph (45 or 35 mph) which could allow the alignment to miss the contaminated areas. The City of Sacramento could pursue a Gatto action against Chevron that would accelerate and compel clean-up.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
70	A - A	Environmental	Alignment C3	Chevron Pipeline Relocation (C3)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			Accept						
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			Mitigate	Engage early and often to work with the public and apply lessons learned from the I Street Bridge.					
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			Accept						

Summary of Alignment D Risks


Broadway Bridge Alignment D - Cost Risk
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Contamination at Chevron Site (C1, C3, D)
Contamination of Ramos Property (D)
Contamination of Phillips Property (D)
Contamination of Phillips / State Lands Property (D)
Acquisition of Buckeye Property (D)
Tie-In at Jefferson Blvd. (D)
Railroad Grade Crossing Permits at Jefferson Blvd. (D)
Acquisition of Phillips Property (D)
Miller Park Road Access Concerns (D)
Steel Prices (ALL)
4-Lane Option Impacts to Caltrans (ALL)
Impacts to Bike Trails (ALL)
Geotechnical Conditions for Bridge Foundations (ALL)
Impacts to Designated Wetlands (ALL)
In-Water Work Windows (ALL)
Contamination at Buckeye Site (D)
Chevron Pipeline Relocation (D)
Scope Changes to South River / 5th Street Tie-In (D)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Tree Removal (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Hydraulic Mitigation Measures (ALL)
Contamination at Bridge Foundations (ALL)
US Coast Guard Permits and Approvals (D)
Acquisition of Ramos Property (D)
Impacts to Marine Species (ALL)
Underwater Obstructions (ALL)
$11,812,500
$8,268,750
$8,015,625
$5,906,250
$5,906,250
$4,809,375
$4,809,375
$4,218,750
$4,218,750
$3,543,750
$3,543,750
$2,531,250
$2,531,250
$1,603,125
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$1,518,750
$1,518,750
$1,518,750
$1,181,250
$1,181,250
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$843,750
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$168,750
($2,000,000)
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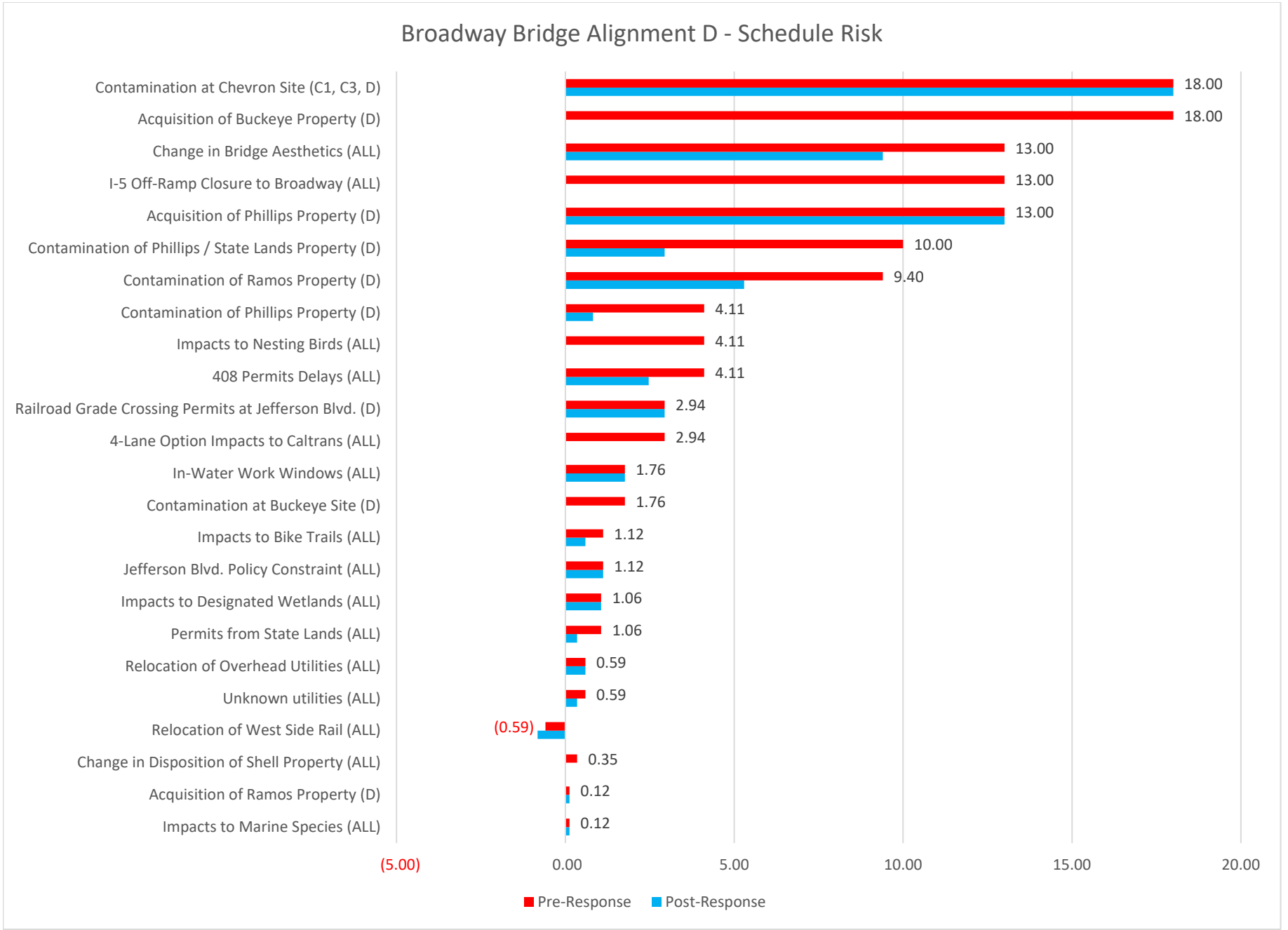
$2,000,000
$4,000,000
$6,000,000
$8,000,000
$10,000,000
$12,000,000
$14,000,000
Pre-Response
Post-Response


Broadway Bridge Alignment D - Schedule Risk
Contamination at Chevron Site (C1, C3, D)
Acquisition of Buckeye Property (D)
Change in Bridge Aesthetics (ALL)
I-5 Off-Ramp Closure to Broadway (ALL)
Acquisition of Phillips Property (D)
Contamination of Phillips / State Lands Property (D)
Contamination of Ramos Property (D)
Contamination of Phillips Property (D)
Impacts to Nesting Birds (ALL)
408 Permits Delays (ALL)
Railroad Grade Crossing Permits at Jefferson Blvd. (D)
4-Lane Option Impacts to Caltrans (ALL)
In-Water Work Windows (ALL)
Contamination at Buckeye Site (D)
Impacts to Bike Trails (ALL)
Jefferson Blvd. Policy Constraint (ALL)
Impacts to Designated Wetlands (ALL)
Permits from State Lands (ALL)
Relocation of Overhead Utilities (ALL)
Unknown utilities (ALL)
Relocation of West Side Rail (ALL)
Change in Disposition of Shell Property (ALL)
Acquisition of Ramos Property (D)
Impacts to Marine Species (ALL)
18.00
18.00
13.00
13.00
13.00
10.00
9.40
4.11
4.11
4.11
2.94
2.94
1.76
1.76
1.12
1.12
1.06
1.06
0.59
0.59
(0.59)
0.35
0.12
0.12
(5.00)
0.00
5.00
10.00
15.00
20.00
Pre-Response
Post-Response

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			95%	T	$8,437,500	$8,015,625	T	18.80	18.00	95%	T	$8,437,500	$8,015,625	T	18.80	18.00
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	T	$5,062,500	$1,518,750	T	5.88	1.76
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			30%	T	$1,687,500	$506,250	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
7	A - A	Permits & Approvals	Alignment D	US Coast Guard Permits and Approvals (D)	The US Coast Guard has stated that they prefer the C alignments. The study team noted that there is a higher potential for the Coast Guard to reject alignment D when compared with other alignments. It is possible that the Coast Guard could require a change in the movable span length.			10%	T	$5,062,500	$506,250	--	0.00	0.00	10%	T	$5,062,500	$506,250	--	0.00	0.00
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			50%	T	$1,687,500	$843,750	--	0.00	0.00	50%	T	$1,687,500	$843,750	--	0.00	0.00
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	T	3.53	2.47
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			10%	T	$1,687,500	$168,750	--	0.00	0.00	10%	T	$1,687,500	$168,750	--	0.00	0.00
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			70%	--	$-	$-	T	5.88	4.11	70%	--	$-	$-	--	0.00	0.00
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			30%	T	$5,062,500	$1,518,750	T	3.53	1.06	30%	T	$5,062,500	$1,518,750	T	3.53	1.06
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			95%	T	$1,687,500	$1,603,125	T	1.18	1.12	50%	T	$1,687,500	$843,750	T	1.18	0.59
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			50%	T	$5,062,500	$2,531,250	T	5.88	2.94	50%	--	$-	$-	--	0.00	0.00
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			70%	T	$11,812,500	$8,268,750	T	18.80	13.00	70%	--	$-	$-	--	0.00	0.00
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			50%	T	$1,687,500	$843,750	T	1.18	0.59	30%	T	$1,687,500	$506,250	T	1.18	0.35
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			30%	T	$1,687,500	$506,250	--	0.00	0.00	30%	T	$1,687,500	$506,250	--	0.00	0.00
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			30%	--	$-	$-	T	3.53	1.06	30%	--	$-	$-	T	1.18	0.35

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			95%	--	$-	$-	T	1.18	1.12	95%	--	$-	$-	T	1.18	1.12
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			10%	T	$5,062,500	$506,250	T	3.53	0.35	10%	--	$-	$-	--	0.00	0.00
38	A - A	Design	Alignment D	Streetcar Interface (C, D)	C and D alignments (more so for the D alignment), may enhance the future streetcar program, making these alignments more attractive.			50%	--	$-	$-	--	0.00	0.00	50%	O	$-	$-	--	0.00	0.00
39	A - A	Environmental	Alignment D	Contamination of Phillips Property (D)	There is a concern that the extent of contamination at the Phillips property could be greater than anticipated and/or the remediation process could delay the project.			70%	T	$8,437,500	$5,906,250	T	5.88	4.11	70%	T	$1,687,500	$1,181,250	T	1.18	0.82
40	A - A	Environmental	Alignment D	Contamination at Buckeye Site (D)	The West Sacramento Buckeye site presents significant contamination concerns (unknown and non-contained). Buckeye doesn't want to move and has litigated with the city in the past.			30%	T	$5,062,500	$1,518,750	T	5.88	1.76	30%	--	$-	$-	--	0.00	0.00
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			50%	T	$5,062,500	$2,531,250	--	0.00	0.00	50%	T	$5,062,500	$2,531,250	--	0.00	0.00
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			50%	O	($1,687,500)	($843,750)	O	(1.18)	(0.59)	70%	O	($1,687,500)	($1,181,250)	O	(1.18)	(0.82)
43	A - A	Permits & Approvals	Alignment D	Railroad Grade Crossing Permits at Jefferson Blvd. (D)	If alignment D is selected, and Broadway Blvd. is extended to Jefferson Blvd., a new railroad grade crossing permit must be obtained. This could result in delays and/or additional mitigation costs.			50%	T	$8,437,500	$4,218,750	T	5.88	2.94	50%	T	$8,437,500	$4,218,750	T	5.88	2.94
45	A - A	Right-of-Way	Alignment D	Acquisition of Buckeye Property (D)	Acquisition of the Buckeye property could be more expensive than anticipated due to the potential for additional relocation costs.			95%	T	$5,062,500	$4,809,375	T	18.80	18.00	95%	--	$-	$-	--	0.00	0.00
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			50%	T	$1,687,500	$843,750	T	1.18	0.59	50%	T	$1,687,500	$843,750	T	1.18	0.59
53	A - A	Design	Alignment D	Scope Changes to South River / 5th Street Tie-In (D)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
61	A - A	Design	Alignment D	Miller Park Road Access Concerns (D)	Would be challenging to maintain dual access to Miller Park given grade changes.			70%	T	$5,062,500	$3,543,750	--	0.00	0.00	70%	T	$5,062,500	$3,543,750	--	0.00	0.00
63	A - A	Design	Alignment D	Tie-In at Jefferson Blvd. (D)	Requires the acquisition of additional right of way to make the connection to Jefferson. Significant right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse property. Alignment D hits the contamination plume, requires the introduction of a railroad grade crossing, and the intersection of Jefferson and alignment-D punch through will require restricted turn movements.			50%	T	$8,437,500	$4,218,750	--	0.00	0.00	50%	T	$8,437,500	$4,218,750	--	0.00	0.00
65	A - A	Right-of-Way	Alignment D	Acquisition of Ramos Property (D)	There could be higher than anticipated acquisition and relocation costs related to the purchase of the Ramos property.			10%	T	$1,687,500	$168,750	T	1.18	0.12	10%	T	$1,687,500	$168,750	T	1.18	0.12
69	A - A	Environmental	Alignment D	Contamination of Phillips / State Lands Property (D)	There is significant diesel and gas contamination at this site.			95%	T	$5,062,500	$4,809,375	T	10.57	10.00	50%	T	$1,687,500	$843,750	T	5.88	2.94

Risk Information								Un-Managed State (Pre-Response)							Managed State (Post-Response)						
									Cost			Schedule				Cost			Schedule		
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Probability	T/O	Impact	Expected Value	T/O2	Impact3	Expected Value4	Probability8	T/O9	Impact10	Expected Value11	T/O12	Impact13	Expected Value14
71	A - A	Environmental	Alignment D	Chevron Pipeline Relocation (D)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			70%	T	$1,687,500	$1,181,250	--	0.00	0.00	70%	T	$1,687,500	$1,181,250	--	0.00	0.00
72	A - A	Environmental	Alignment D	Contamination of Ramos Property (D)	Due to the existence of a wharf at this site, there are likely contaminants in the water. Remediation of the Ramos site will presumably be more expensive than the Chevron and Shell sites, as there are metal contaminants at this site. Worse for alignment D than other alignments.			50%	T	$11,812,500	$5,906,250	T	18.80	9.40	50%	T	$11,812,500	$5,906,250	T	10.57	5.29
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			70%	T	$16,875,000	$11,812,500	T	18.80	13.00	50%	T	$16,875,000	$8,437,500	T	18.80	9.40
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			30%	T	$5,062,500	$1,518,750	--	0.00	0.00	30%	T	$5,062,500	$1,518,750	--	0.00	0.00
76	A - A	Right-of-Way	Alignment D	Acquisition of Phillips Property (D)	There is the potential that the small Phillips tank farm parcel that alignment D bisects could precipitate higher than anticipated cost and schedule impacts.			70%	T	$5,062,500	$3,543,750	T	18.80	13.00	70%	T	$5,062,500	$3,543,750	T	18.80	13.00
											$84,375,000							**$52,903,125**			

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
1	A - A	Environmental	All Alignments	Contamination at Chevron Site (C1, C3, D)	The Chevron property is an operational tank storage site, and has been located in its current location for roughly 50 years. Major concerns related to this site are soil and ground water contamination, though soil contamination is easier to clean up, and is regarded as less problematic than ground water contamination. Contamination at this site is more severe than the contamination at the Shell property. Schedule delays are likely for all alignments.			Mitigate	Cap the existing roadway area wells, install new monitoring wells, and relocate or abandon impacted monitoring wells.					
4	A - A	Environmental	All Alignments	In-Water Work Windows (ALL)	It is possible that in-water work windows could be shortened which could cause construction delays. The current windows are about 8 months long (March through October).			Accept	The current in-water work window of 8 months should be sufficient to address any issues.					
5	A - A	Environmental	All Alignments	Contamination at Bridge Foundations (ALL)	The hazardous materials SME noted the river sediment will likely contain material washed downstream from the agriculture fields.			Mitigate	Perform additional borings at bent locations. Adjust design as necessary, if practical.					
7	A - A	Permits & Approvals	Alignment D	US Coast Guard Permits and Approvals (D)	The US Coast Guard has stated that they prefer the C alignments. The study team noted that there is a higher potential for the Coast Guard to reject alignment D when compared with other alignments. It is possible that the Coast Guard could require a change in the movable span length.			Accept	Perform early consultations.					
8	A - A	Environmental	All Alignments	Tree Removal (ALL)	There is a potential for increased tree mitigation costs related to the removal of mature trees.			Accept	This is a minor risk and the required tree mitigation ratios will have to be met.					
9	A - A	Permits & Approvals	All Alignments	408 Permits Delays (ALL)	There is a risk of schedule delays in obtaining 408 permits from USACE.			Mitigate	Begin 408 consultations early. Begin process to establish location of theoretical levee prism and related improvements.					
10	A - A	Environmental	All Alignments	Underwater Obstructions (ALL)	There is a low potential that unknown obstructions could be encountered during construction (sunken ships or other objects).			Mitigate	Consider performing underwater investigations to identify potential obstructions.					
11	A - A	Environmental	All Alignments	Impacts to Marine Species (ALL)	Impacts to marine species result in permits that increase cost or schedule			Accept						
13	A - A	Environmental	All Alignments	Impacts to Nesting Birds (ALL)	Potential impacts to cost and schedule related to nesting birds.			Avoid	If NTP is at an inopportune time for nesting birds, consider an advance clearing and grubbing contract to remove bird nesting habitats prior to the nesting season.			Small contract administrative cost for advance clearing and grubbing at approximately $50,000.		
14	A - A	Environmental	All Alignments	Impacts to Designated Wetlands (ALL)	Designated wetland inventory has not been completed.			Accept	Complete wetlands inventory as soon as practical.					
15	A - A	Design	All Alignments	Impacts to Bike Trails (ALL)	This project, regardless of alignment, is expected to impact bike paths along either side of the Sacramento river. On the City of Sacramento side of the river, property will need to be acquired to accommodate a route change and maintain a through-path. On the City of West Sacramento side of the river, no property will need to be acquired, but the through-path will need to be altered in light of the selected alignment (design consideration).			Mitigate	Work proactively with cities and bicycle community to develop viable strategies for the bridge / bike path interface.					
16	A - A	Design	All Alignments	4-Lane Option Impacts to Caltrans (ALL)	This risk is linked to the 4-lane option for the Broadway Bridge. If four lanes are carried under I-5, there will be additional right of way impacts.			Avoid	Do not pursue this option.					
17	A - A	Design	All Alignments	I-5 Off-Ramp Closure to Broadway (ALL)	This risk is related to right of way, public opposition, liquidated damages from local businesses, and would require a redesign of said interface, however it will remain an option if the Broadway connection is not used.			Avoid	Pursue other strategies to divert traffic from Broadway Blvd. to X St.			Could include diverting traffic via Third St. which would require traffic improvements between $1 and $3 million for construction and right of way costs.		
19	A - A	Utilities & Agreements	All Alignments	Unknown utilities (ALL)	There is a moderate chance of encountering unknown, buried utilities for all the alignments based on past and current industrial land uses.			Mitigate	Potholing and/or GPR could be utilized to identify utilities during design.			Approximately $100,000.		
22	A - A	Hydraulics	All Alignments	Hydraulic Mitigation Measures (ALL)	Impacts to cost and schedule related to perceived hydraulic impacts could result related to additional mitigation or design modifications. If USACE does not allow for fill in the floodplain, then the structure may have to be increased from 100 to 400 feet in length.			Mitigate	Engage in early consultations with USACE to determine the extent of impacts and possible mitigations.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
23	A - A	Environmental	All Alignments	Permits from State Lands (ALL)	On the City of Sacramento side (for all alignments), there is a concern that the conditions for permits from State Lands are unknown and could take additional time to resolve.			Mitigate	Perform early consultations with State Lands to identify issues as quickly as possible.					
25	A - A	Permits & Approvals	All Alignments	Jefferson Blvd. Policy Constraint (ALL)	There is a policy constraint for all alignments when tying into Jefferson Blvd. on the West Sacramento side of the proposed bridge. It is possible that there could be a short delay as City Council tries to resolve any disputes.			Mitigate	Begin consultations with West Sacramento City Council early to reduce potential for delays.					
33	A - A	Right-of-Way	All Alignments	Change in Disposition of Shell Property (ALL)	The Port of Sacramento could lease the Shell site to a commercial interest, sell the property, or back out of the acquisition altogether (the port is an enterprise fund). Low likelihood due to an existing strong relationship with Port.			Avoid	West Sacramento to commence acquisition immediately following ROD to minimize potential of Port making an alternative decision.					
38	A - A	Design	Alignment D	Streetcar Interface (C, D)	C and D alignments (more so for the D alignment), may enhance the future streetcar program, making these alignments more attractive.			Enhance	Perform financial analysis of tax increment funding related to increased development. Potential to offset the additional costs of alignment D compared to others.					
39	A - A	Environmental	Alignment D	Contamination of Phillips Property (D)	There is a concern that the extent of contamination at the Phillips property could be greater than anticipated and/or the remediation process could delay the project.			Accept						
40	A - A	Environmental	Alignment D	Contamination at Buckeye Site (D)	The West Sacramento Buckeye site presents significant contamination concerns (unknown and non-contained). Buckeye doesn't want to move and has litigated with the city in the past.			Avoid	Shift alignment of intersection to Circle St. and avoid existing contamination plume. Requires acquisition of existing warehouse and additional traffic mitigation.					
41	A - A	Market Conditions	All Alignments	Steel Prices (ALL)	Steel prices could increase over the next decade.			Accept						
42	A - A	Design	All Alignments	Relocation of West Side Rail (ALL)	The West Sacramento side rail may be relocated prior to the construction, thereby better facilitating the extension of Broadway to Jefferson Blvd.			Enhance	West Sacramento would continue its technical analysis of rail relocation, move into implementation, and seek funding.					
43	A - A	Permits & Approvals	Alignment D	Railroad Grade Crossing Permits at Jefferson Blvd. (D)	If alignment D is selected, and Broadway Blvd. is extended to Jefferson Blvd., a new railroad grade crossing permit must be obtained. This could result in delays and/or additional mitigation costs.			Mitigate	Engage in early consultations with CPUC and RR line operator.					
45	A - A	Right-of-Way	Alignment D	Acquisition of Buckeye Property (D)	Acquisition of the Buckeye property could be more expensive than anticipated due to the potential for additional relocation costs.			Avoid	Shift alignment north to avoid/minimize Buckeye acquisition and eliminate relocation costs, and reduce acquisition costs.			$9 million is assumed for potential relocation costs.		
48	A - A	Utilities & Agreements	All Alignments	Relocation of Overhead Utilities (ALL)	There are extensive overhead utilities along Broadway Blvd. on the Sacramento side of the project. These will likely have to be relocated to accommodate the widened facility cross section.			Accept						
53	A - A	Design	Alignment D	Scope Changes to South River / 5th Street Tie-In (D)	May require additional improvements in the vicinity of the project. Depending on the final location of the tie in of the Broadway Bridge to South River / 5th Street (for alignments C and D) there may be a need for additional local road improvements to accommodate traffic movement (i.e. additional lanes, intersection widening, signal modifications). It's likely that additional right-of-way will be required.			Accept						
61	A - A	Design	Alignment D	Miller Park Road Access Concerns (D)	Would be challenging to maintain dual access to Miller Park given grade changes.			Accept	Begin early consultations with third parties including USACE, Central Valley Flood Protection Board, and Sacramento Public Works.					
63	A - A	Design	Alignment D	Tie-In at Jefferson Blvd. (D)	Requires the acquisition of additional right of way to make the connection to Jefferson. Significant right of way costs (though better than alignments A and B). This strategy could be implemented in an incremental fashion over time by first touching down at 5th Street; then modifying the tie-in from bridge terminus to go through the shell property; then purchasing the Ramos warehouse property. Alignment D hits the contamination plume, requires the introduction of a railroad grade crossing, and the intersection of Jefferson and alignment-D punch through will require restricted turn movements.			Mitigate	The phased approach will allow for the removal of the railroad and clean-up of contamination which will reduce the potential for delays and eliminate the grade change precipitated by the railroad alignment which will be removed by the time of the extension. The strategy will be to buy time to ensure the removal of the railroad to avoid mitigations that may otherwise be required by permitting a new railroad grade crossing.					

Risk Information								Risk Management Plan: Monitor & Control							
Risk #	Status Pre - Post	Risk Category	Impacted Phase	Risk Event Name	S.M.A.R.T. Risk Description (Specific, Measurable, Attributeable, Relevant, and Time Bound)	Risk Trigger (Symptoms)	Additional Comments	Risk Response Strategy	Action Plan Description(s)	Risk Owner	Risk Review Milestone / Frequency	Base Cost Impacts	Base Schedule Impacts	Updates
65	A - A	Right-of-Way	Alignment D	Acquisition of Ramos Property (D)	There could be higher than anticipated acquisition and relocation costs related to the purchase of the Ramos property.			Accept						
69	A - A	Environmental	Alignment D	Contamination of Phillips / State Lands Property (D)	There is significant diesel and gas contamination at this site.			Mitigate	The current horizontal curves for the roadway on the east side of Broadway Blvd. are designed as 55 mph curves. The geometry could be modified to less than 55 mph (45 or 35 mph) which could allow the alignment to miss the contaminated areas. The City of Sacramento could pursue a Gatto action against Chevron that would accelerate and compel clean-up.					
71	A - A	Environmental	Alignment D	Chevron Pipeline Relocation (D)	It is possible that some of the alignments may impact the existing 8-inch Chevron pipeline. The pipeline in question is owned by Chevron and feeds the Chevron facility.			Accept						
72	A - A	Environmental	Alignment D	Contamination of Ramos Property (D)	Due to the existence of a wharf at this site, there are likely contaminants in the water. Remediation of the Ramos site will presumably be more expensive than the Chevron and Shell sites, as there are metal contaminants at this site. Worse for alignment D than other alignments.			Mitigate	The City of West Sacramento could pursue a Gatto action against Ramos that would accelerate and compel clean-up.					
74	A - A	Design	All Alignments	Change in Bridge Aesthetics (ALL)	There is a potential that there is political pressure to enhance the aesthetics of the Broadway Bridge to deliver an iconic structure. This could add time and costs to the project and possibly precipitate a change in structure type.			Mitigate	Engage early and often to work with the public and apply lessons learned from the I Street Bridge.					
75	A - A	Geotechnical	All Alignments	Geotechnical Conditions for Bridge Foundations (ALL)	There is limited geotechnical information regarding soil conditions along the Sacramento River. There is a potential that conditions could precipitate changes in the foundation type, cost and schedule.			Accept						
76	A - A	Right-of-Way	Alignment D	Acquisition of Phillips Property (D)	There is the potential that the small Phillips tank farm parcel that alignment D bisects could precipitate higher than anticipated cost and schedule impacts.			Accept				The estimated acquisition and relocation cost is $6.5 million.		

WORKSHOP INFORMATION

WORKSHOP INFORMATION DRAFT

The following pages present a summary of participants and the agenda for the workshop conducted June 6-8, 2017.

PARTICIPANTS

Name	Role	Organization
Jesse Gothan	Supervising Engineer	City of Sacramento
Katie Yancey	ED	City of West Sacramento
Jason McCoy	Project Manager	City of West Sacramento
Rafael Martinez	Engineering Manager	City of West Sacramento
Zach Siviglia	Project Manager	Mark Thomas & Company
Rob Himes	PIC	Mark Thomas & Company
Eric Fredrickson	Structures	Mark Thomas & Company
Kira Davis	Engineer	Mark Thomas & Company
Jason Hickey	Bridge Engineer	Mark Thomas & Company
Scott McHenry	Senior Transportation Engineer	FHWA
Debbie Kern	Economist	Keyser Marston
James Ritchie	Hazmat/Geologist	SCS Engineers
Bob Lagomarsino	Planner	Mintier Harnish
Christine Zdunkiewicz	Engineer/Traffic	Caltrans
Jimmy Fong	Engineer/Planner	Fehr & Peers
David Carter	Senior Associate	Fehr & Peers
Lance Borden	Moveable Structures	Modjeski & Masters
Kevin Johns	Moveable Structures	Modjeski & Masters
Rob Stewart	Risk Lead	VMS, Inc.
Damon Yeutter	Assistant	VMS, Inc.

AGENDA

The agenda for the Risk Assessment workshop conducted June 6-8, 2017 is included on the following pages.

TUESDAY, JUNE 6

8:00 – 8:15 Introductions (All) and Brief Overview of the Risk Analysis Process
8:15 – 9:15 Project Overview (Project Manager and Engineers)
- Alignment Options
- Schedule
- Cost

9:15 – 12:00 RISK IDENTIFICATION: Discuss risks identified by participants and revise risk register
12:00 – 1:00 Lunch
1:00 – 5:00 RISK ANALYSIS: Perform risk analysis (assign probabilities and impacts to risks)
1:00 – 2:00 Right-of-Way/HAZMAT/Utilities SMEs
2:00 – 3:00 Traffic Operations SMEs (Caltrans/Sacramento/West Sacramento)
3:00 – 4:00 Geotechnical/Structural SMEs (Caltrans/Design Team)
4:00 – 5:00 Environmental/Permits SMEs (USACE/Coast Guard/Fish & Wildlife/Etc.)

WEDNESDAY, JUNE 7

8:00 – 12:00 RISK ANALYSIS (continued)
12:00 – 1:00 Lunch
1:00 – 5:00 RISK ANALYSIS (continued)

THURSDAY, JUNE 8

8:00 – 12:00 RISK RESPONSE PLANNING: Identify potential response strategies to manage risks
12:00 – 1:00 Lunch
1:00 – 2:30 RISK RESPONSE PLANNING (continued)
2:30 – 3:30 Review Results and Preparation for Presentation
3:30 – 4:30 Risk Analysis Workshop Presentation
4:30 Adjourn

Value Management Strategies, Inc.

**Offices in Escondido California; Grand Junction, Colorado; Chicago, Illinois;
Portland, Oregon; Seattle, Washington; Las Vegas, Nevada; and Kansas City, Missouri**

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DRAFT Risk Assessment Report

Broadway Bridge Feasibility Study: Conceptual Alignment Alternatives Risk Assessment

City of Sacramento; City of West Sacramento

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