

CITY AND COUNTY OF SAN FRANCISCO
BOARD OF SUPERVISORS
BUDGET AND LEGISLATIVE ANALYST
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Policy Analysis Report

To: President Shamann Walton
CC: Board of Supervisors
From: Budget and Legislative Analyst's Office
Re: Options for the Adoption of a Policy Regarding Itemized Assessments of De-Risking Activities for Major Capital Projects
Date: March 31, 2022



Summary of Requested Action

The Board of Supervisors directed the Budget and Legislative Analyst to issue a report analyzing options for the adoption of a policy regarding itemized assessments of de-risking activities for major capital projects. This direction was given in Board Resolution 496-21 (File 21-0703), which was unanimously adopted on October 19, 2021.

For further information about this report, contact Dan Goncher at the Budget and Legislative Analyst's Office.

Executive Summary

- The 2020-2021 San Francisco Civil Grand Jury made the Van Ness Improvement Project the subject of one of their reports. The project had significant cost and schedule overruns, and in their report, "Van Ness Avenue: What Lies Beneath," the Grand Jury found that one of the major factors contributing to the overruns was unknown underground utility conditions. Furthermore, the Grand Jury concluded that the Van Ness Improvement Project delays are emblematic of systematic issues that the City faces when delivering major capital infrastructure projects, including procedures around project scoping and risk identification.
- One way to address risks on a capital project is to perform de-risking work, which the Grand Jury defines as "the process of making a project more predictable by reducing the possibility that something can go wrong." The Grand Jury found that the Van Ness Bus Rapid Transit project could have mitigated the underground risks with better de-risking activities. The Grand Jury therefore recommended that the City adopt a policy that all major capital projects must publish a list of de-risking activities that were performed prior to starting construction.

Budget and Legislative Analyst

- City departments vary in their approach to minimizing risks associated with major capital projects. Although no departments have a formal written policy on de-risking in the manner outlined by the Grand Jury, most departments undertake some form of de-risking activities on projects depending on the scope of the project.
- When asked about a potential citywide de-risking policy, department representatives emphasized the importance of flexibility regarding such a policy because of the variation in project types across departments. Variations in project size, location, and type affect the kinds of risks the project faces and the kinds of de-risking activities that could be done. Department representatives said that a one-size-fits-all policy regarding de-risking activities for major capital projects would be challenging to implement successfully. Therefore, we analyzed options for departments to waive the requirement, or create department-specific de-risking policies, as part of our analysis.
- In addition to flexibility, other factors we analyzed for this policy include when to publish the de-risking activities, where to publish them, and whether there should be a threshold to determine which major capital projects are subject to the de-risking policy.

Policy Options

Based the fieldwork we conducted, which included interviews with department representatives and a review of industry best practices, we did not find enough evidence to support the adoption of a policy regarding itemized assessments of de-risking activities for all major capital projects in San Francisco. Such a policy might be challenging to implement because of the variation in project management practices across departments and because of the wide variety of types of capital projects managed citywide.

However, the Board might choose to implement the policy because it could lead to the improved scoping of major capital projects, increase the accountability of capital project sponsors, and reduce potential project delays.

If the Board chooses to implement a policy requiring that project sponsors publish a list of de-risking activities performed before a project's construction phase, we recommend that the Board consider the following as a *minimum* requirement at various project thresholds:

1. For projects with budgets of \$100 million or larger:
 - a. Instruct department heads to create an internal, written policy regarding which de-risking activities must be published.
 - b. Require that the list of de-risking activities be posted to the individual project website or, if one does not exist, to the sponsoring department's website.
 - c. Require the list be posted pre-bid (for projects delivered through the Design-Bid-Build method only¹).
2. For projects with budgets between \$50-\$100 million:
 - a. Instruct department heads to create an internal, written policy regarding which de-risking activities must be completed prior to construction.
 - b. Require that departments incorporate the performance of the required de-risking activities into existing project management processes, such as DPW's Quality Assurance Quality Control Plan process.
3. Allow department heads to waive the de-risking policy requirement for projects with budgets of less than \$50 million at their discretion.

<i>Project Staff: Dan Goncher, Anna Garfink</i>

¹ For Design-Build, CMAR, and CMGC projects, the list should be published before the construction phase; this would likely be after the Construction Manager is procured as the Construction Manager typically is brought on early in the design process.

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Background

The Van Ness Improvement Project

The Van Ness Improvement Project is a major capital project involving infrastructure upgrades and the installation of bus rapid transit (BRT) lanes along the length of the Van Ness corridor. The project was first studied for feasibility following the 2003 passage of the Prop K sales tax and in 2013 the Board of Supervisors voted to authorize the Van Ness BRT project. The original goals of the project, as stated by the San Francisco County Transportation Authority in the initial 2006 feasibility study, were to:

1. Improve the level of service for existing transit passengers;
2. Establish an efficient north/south link in San Francisco's transit network;
3. Support the identity of the Van Ness corridor through a robust landscape and urban design program that also integrates new transit infrastructure with adjacent land uses; and
4. Develop standards for implementing BRT services citywide.

The project spans Van Ness Avenue from Lombard Street to Mission Street and includes replacement of aging sewer, water, and streetlight infrastructure throughout the corridor, improved pedestrian safety designs, and two center-running BRT lanes (one northbound, one southbound) with nine new median bus stops. As of March 2022, the project is nearing completion, and the San Francisco Municipal Transportation Agency (SFMTA) estimates that BRT service will begin on the corridor on April 1, 2022.

The Civil Grand Jury Report

The current project completion date is nearly three years later than the project was originally scheduled to be completed, and the budget has increased from its original estimates as well. The significant schedule and cost overruns of the project were the subject of a 2020-2021 San Francisco Civil Grand Jury report entitled "Van Ness Avenue: What Lies Beneath." The original project budget was estimated at \$309 million, including \$193 million in construction costs, with construction beginning in 2016 and a planned construction completion date of late 2019. However, the final budget for the project has increased – as of June 2021 it was \$346 million, which is 12 percent higher than the original budget – and the revenue service date is scheduled for April 1, 2022.

The 2020-2021 Civil Grand Jury investigated the causes of schedule delays and cost increases and made over a dozen findings and recommendations related to the City's ability to deliver major capital projects like Van Ness BRT. The Grand Jury's major finding was that the Van Ness BRT project and its delays are emblematic of systematic issues that the City faces when delivering major capital infrastructure projects. Specifically, the Grand Jury found that:

1. Planning and design processes failed to capture the scope of the project adequately;
2. Contracting processes failed to instill accountability; and,

3. Ongoing project management failed to remediate problems efficiently and effectively.

The scope of this report is focused on item #1: Planning and design processes failed to capture the scope of the project adequately. The Grand Jury made several findings and recommendations related to City project management practices addressing scope; however, the focus of this report is on a few specific findings and one recommendation on risk management for capital projects.

De-risking Activities and the Van Ness Improvement Project

The Grand Jury found that underground utilities were a major factor in the nearly three-year delay in the Van Ness BRT project schedule and made it a focus of their report on the project. SFMTA staff have stated that it was not possible to fully know the state of the underground utilities and the subsequent time it would take to fully investigate and solve the problem before breaking ground. However, the Grand Jury disagreed with that assertion and found that the state of the underground utilities, and the risks they posed to the project schedule and budget, could have been identified in advance with proper de-risking work (the Grand Jury defines de-risking as “the process of making a project more predictable by reducing the possibility that something can go wrong”). Though the term “de-risking” is less common, de-risking activities on major construction projects are very common and range from exploratory potholing² (to identify the location of underground utilities) to monthly meetings between various stakeholders to discuss challenges in the project. The Grand Jury found that the SFMTA’s de-risking activities on the Van Ness BRT project were insufficient. Specifically, their findings on de-risking activities were:

- F1. The delays in completion of the Van Ness BRT Project were caused primarily by avoidable setbacks in replacement of the water and sewer infrastructure.
- F2. The potential impact of utility replacement on the cost and duration of the overall project was given insufficient consideration in the initial planning process.
- F3. The potential impact of utility replacement was known to City engineers to be a major risk but was only considered a moderate risk and assigned no mitigation strategy in the official risk register.
- F4. Project timelines could not be estimated accurately because documents did not reflect the extent and location of underground utilities accurately.
- F6. Practical work during preconstruction that could have de-risked the subsequent construction phase of the project was insufficient.³

² Potholing is defined by the Grand Jury as “the practice of digging a series of test holes to expose underground utilities in order to ascertain their horizontal and vertical locations.”

³ Note: Finding 5 (F5) as well as findings 7 through 14 (F7 to F14) did not pertain directly to de-risking activities and are therefore not included in this list.

Though there were several findings, and four recommendations, related to de-risking, the BLA was directed to address the following recommendation by the Board of Supervisors in Resolution 496-21:

By June 2022, the City should adopt a policy that all capital project sponsors publish, before proceeding to the construction phase, an itemized assessment of de-risking activities actually performed.

This report identifies and analyzes the major options the Board should consider for the adoption of a citywide policy on itemizing and reporting de-risking activities. We spoke with representatives of all departments authorized to sponsor capital projects to understand the potential benefits and risks of such a policy. These departments include:

- Public Works (DPW)
- San Francisco Public Utilities Commission (SFPUC)
- San Francisco Municipal Transportation Agency (SFMTA)
- Recreation and Parks (REC)
- Port of San Francisco (Port)
- Airport

Our findings are summarized in the following section.

Analysis

De-risking in San Francisco

Identifying and recording the potential risks to a project's scope, schedule, and budget are already common practices among City departments that sponsor major capital projects. Indeed, the Grand Jury recommended that citywide, all capital projects must include an itemized risk assessment, and the Board of Supervisors reported that that recommendation had already been implemented. However, our interviews with City department representatives revealed that there is variation in the types of projects that are sponsored by different departments citywide and, therefore, there is variation in which projects get itemized risk assessments (also called risk registers or risk matrices in the construction industry), what kinds of risks are identified, and how much de-risking is done to reduce the size of the identified risks.

Departments vary in which projects get risk registers, how formally they document the risk registers, and how much de-risking they do for different projects. Furthermore, no department has a specific formal written policy regarding risk registers or de-risking activities in the manner outlined by the Grand Jury, including defining the types of projects that require risk registers and

the amount of de-risking required for each project.⁴ The variation in approaches to risk management and the variation in types of capital projects constructed by each department (projects can range in size and scope from the \$346 million Van Ness BRT project to the \$3.3 million Shoreview Park Renovation Project by Recreation and Parks) led department representatives to emphasize with us the importance of flexibility when developing a citywide de-risking policy.

At DPW, a culture of institutional knowledge-sharing and nearly a century's worth of experience managing right-of-way projects has led to a reliance on project managers and engineers to understand the types of risks that will be associated with a project based upon that project's specific scope, size, complexity, and location, and to respond accordingly. Bruce Robertson, Deputy Director for Financial Management and Administration at DPW, said that creating risk registers was already a basic core function of DPW's project management process, although only for larger capital projects. Carla Short, Public Works Interim Director, added that identifying the steps to be taken to minimize the risks identified was also already part of DPW's risk management process.

Other departments vary in their risk identification and mitigation strategies. At the Airport, project managers utilize the practice of partnering to minimize risks on major capital projects. Judi Mosqueda, Director of Project Management for Planning, Design, and Construction at the Airport, explained that the practice involves bringing in a neutral third party to facilitate monthly collaborative sessions between City project staff and the contractor team. The partnering sessions are a chance for the team to discuss risks as they arise and brainstorm risk mitigation measures as a team. At the SFMTA, project teams are required under the Project Operations Manual (POM) and Federal Transit Authority guidelines to implement a risk management plan that identifies, measures, and mitigates risks as defined in an individual or comprehensive Project Management Plan. Additionally, SFMTA and SFPUC staff have been working towards incorporating risk registers and risk identification into their capital project management, and representatives for both agencies agreed that risk registers are a best practice for major capital projects. At the Port and REC – two smaller departments with much smaller capital budgets – de-risking is done on a project-by-project basis. At the Port, it depends on the size of the project budget and the risks identified. DPW provides design and construction management services for

⁴ In response to our draft report, staff from DPW, SFMTA, and SFPUC noted that they have procedures in place to either de-risk on all projects (DPW shared Procedure 10-05-01 which is a Quality Assurance/Quality Control procedure that includes required reviews based on project type), prepare a risk management plan (SFMTA), or generally cover the pre-construction and construction phases (SFPUC). However, other than from DPW's Procedure 10-05-01, we did not receive a formal written policy from any of the departments that we interviewed that specifically defines which projects require de-risking activities nor the amount of de-risking required.

most large capital Recreation and Park projects, so REC project managers follow DPW's methods regarding risk.

Industry Best Practices

Several industry best practice documents include guidance on identifying and measuring risk throughout the design and construction phases of a project. We found that these best practices are consistent with the internal practices reported by most City department representatives. The American Public Works Association's *Public Works Management Practices Manual* recommends thorough planning of utility coordination when designing a project, including utility coordination committees, uniform utility placement guidelines, and excavation damage prevention guidelines; however, nowhere in the manual does it suggest publishing the efforts taken to identify, coordinate, or work around underground utilities. Additionally, the American Society of Civil Engineers' *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*, which the Grand Jury cites in their report, also does not include a procedure to publicly report the efforts taken by capital project managers to identify underground utility data.

Policy Options: Publishing De-risking Activities Citywide

Types of De-risking Activities to Include

There is great variation in the types of capital projects, and their associated risks, across departments. As a result, there is also variation in the types of de-risking activities that are appropriate. Risks vary from unknown underground utilities, supply chain problems, political sensitivities, and equipment maintenance problems. Risk registers put together by City staff typically capture all of these risks. Examples of risk registers used by SFPUC and the Airport have been included in Appendix A of this report.

Department representatives repeatedly emphasized to us the need for flexibility when interpreting a potential de-risking policy so that the policy can be suited to the individualized nature of most major capital projects in San Francisco and warned against a prescriptive, one-size-fits-all policy. Exhibit 1 below shows several options for specifying the types of de-risking activities in a citywide de-risking policy that the Board could implement.

Exhibit 1: Options of De-risking Activities to Include in Citywide Policy

De-risking Activities to Include	Benefits	Risks
Instruct department heads to create internal, written policy regarding which de-risking activities must be published.	- Flexibility for departments - Instills accountability	- Discrepancies due to different interpretations by each department - Some departments may not follow through with the requirement
Prescribe a policy of which de-risking activities must be included, but allow department heads to waive requirement for certain projects at their discretion. The Board could require departments to document justification for waiving requirements under this option for greater accountability.	- Flexibility for departments - Support from departments	Some projects will not get reported on
Prescribe a list of de-risking activities that must be reported for every project that meets the policy threshold (see “Project Threshold,” below).	Consistent across departments and projects	- Some projects could be delayed due to difficulty meeting strict reporting requirements, which would lead to cost increases - Lack of support from departments - Challenging to implement

Source: BLA analysis

The benefits of a more prescriptive policy are that there would be more citywide consistency across departments and projects regarding reporting on de-risking activities. Whichever type of de-risking activities the Board elects to include in the policy would be required to be reported on by every department for every project that meets the threshold. However, department

representatives indicated to us that such a policy could be challenging to implement for several reasons. First, types of risks, and their corresponding de-risking activities, can vary across departments and across types of projects. Creating a uniform list of citywide de-risking activities could lead to a situation where the list includes de-risking activities that would not otherwise be necessary for certain projects or omits some critical de-risking activities for others. Additionally, narrowly prescribing the list of which activities must be reported on could lead to project delays as some departments could struggle to adhere to the requirements and it could take longer to publish the list and, therefore, could take longer to proceed to the construction phase of a project. Delays in construction projects cost money, sometimes hundreds of thousands of dollars per month for major projects, and so this de-risking policy could lead to a kind of situation it is intended to prevent. Providing departments with either the opportunity to waive the requirement for certain projects or the ability to create their own policy regarding the types of de-risking activities they will report on would ensure that departments have a policy that they are able to implement smoothly and without delays, although it could lead to inconsistencies citywide regarding the types of de-risking activities reported.

When to Publish the List of De-risking Activities

The Grand Jury's recommendation leaves some room for flexibility regarding the timing of publishing the de-risking activities. They recommended that it should be published before construction begins, but that leaves a wide window in which to publish. Several department representatives, and the SFMTA in their formal response to the Grand Jury, voiced concern for the validity of the bidding process if de-risking activities are published in a manner that enables bidders to use them to their unfair advantage during the procurement process. Specifically, if construction contract bidders are provided a definitive list of de-risking activities by the City, then the contractor might be able to take advantage of that list by turning any deviation from what is identified during the de-risking process (i.e., the number of utilities underground) into a change order that drives up the cost to the City. The current practice, with no definitive list of de-risking activities, puts identifying, measuring, and mitigating risks onto the contractor in a CMGC contract. Several department representatives emphasized in our interviews that, with underground construction work, it is impossible to perfectly mitigate every single risk, and there will always be unknowns. Publishing a list of de-risking activities prior to the award of a construction contract could make it much easier for a contractor to take advantage of the City with respect to those unknowns. However, this could be mitigated somewhat through the use of alternative project delivery methods that engage the general contractor in the design process and therefore place more responsibility for de-risking onto the general contractor. Exhibit 2 below shows the options for the timing of publishing the de-risking activities with associated benefits and risks. Note that these options apply to projects that utilize traditional project delivery methods, namely Design-Bid-Build because the contractor would not be typically brought onto the project during the design phase.

Exhibit 2: Options for Timing of Publishing De-risking Activities

Timing	Benefits	Risks
Publish pre-bid	More time to catch a potential risk and mitigate it before construction starts	Contractors could take advantage and submit more change orders during construction
Publish post-bid ⁵	Avoid unfair bidding advantages while maintaining accountability	Legal risks regarding withholding information from bidders
Do not proactively publish, but create list and publish at discretion of department head	- Reduces risk of conflicts with bidders - Requires the de-risking work be performed and documented	Does not instill same level of accountability as publishing publicly
Do not proactively publish, but incorporate into existing project management checkpoints (e.g. DPW's Quality Assurance Quality Control Plan)	- Easy to implement - Avoids potential conflicts with bidders - Holds project sponsors accountable for completing de-risking activities	- Decentralized – implementation could look different for each department depending on their internal project controls - Does not instill same level of accountability as publishing publicly

Source: BLA analysis

Publishing the list of de-risking activities after the bid is completed is inadvisable for legal reasons. According to a Deputy City Attorney we spoke with, this would likely lead to bidders protesting the outcome of a bid, arguing that they would have bid differently – and possibly won the bid – had they known about the list of de-risking activities. The risks associated with publishing the list before the bid are smaller, but still present (e.g., higher bids). Some City staff

⁵ Note: This option is only relevant to projects that utilize the Design-Bid-Build project delivery method. For projects that utilize the Construction Manager/General Contractor (CMGC) or Design-Build project delivery methods, a contractor would be selected early in the project timeline and would presumably be assisting with or leading the identification of risk and de-risking activities.

we spoke with expressed their concern that more information presented to bidders and included in their proposals means more potential change orders (and higher costs) down the line if real conditions deviate from the designs. Since it is impossible for preconstruction de-risking activities to eliminate every single uncertainty from a project, some department representatives have suggested that publishing the list of de-risking activities before the bidding process could lead to more change orders as unexpected deviations occur. However, a Deputy City Attorney specializing in construction we spoke with believes this to be a minimal risk, as publishing the list of de-risking activities does not create conditions giving rise to change orders; rather, those conditions exist regardless and it becomes an issue of increased accuracy in cost predicting. Furthermore, this issue is less relevant if project sponsors utilize the Construction Manager/General Contractor (CMGC) or Design-Build methods of delivering the project. Both methods differ from the traditional Design-Bid-Build method of delivering a capital project by partnering with the contractor during the early stages of design. In these instances, the contractor is part of the project team in the preconstruction phase and should therefore be expected to lead the de-risking work, making the risks associated with publishing the de-risking work pre-bid moot.

To avoid the issues of when to publish the list of de-risking activities performed, the Board could choose to not pass an ordinance requiring the list be published publicly. Instead, the Board could require that a list be created for certain types of projects and published at the discretion of the department head, though the document would likely still be subject to Sunshine requests. Furthermore, the Board could require that performing de-risking activities, and being held accountable for doing so, be incorporated into existing project management systems. This option reduces the risk of conflicts with the bidding process but still requires de-risking activities be performed and documented. Many departments already require that project managers certify the completion of key project milestones prior to proceeding to the construction phase of a project – for example, that a project has had a constructability review done – in the form of a checklist to be signed off by key project managers. DPW’s Quality Assurance Quality Control Plan, for example, could be amended to clarify and amplify “de-risking activities completed” by way of the Quality Assurance Quality Control process throughout the design phases. This would hold project sponsors accountable for completing the de-risking activities prior to construction, and it would be relatively easy for departments to implement, although there would be some variation across departments given the variation in internal controls process.

Project Threshold

Throughout our conversations with department representatives, it became clear that not every capital project constructed in the City has a risk register or de-risking activities associated with it. Projects that go through such extensive risk identification and mitigation efforts are primarily large and/or complicated. For this policy, the Board could set a threshold to determine which

major capital projects would be subject to the requirement. Exhibit 3 below shows three options for the Board to consider if it chooses to set a threshold for requiring de-risking.

Exhibit 3: Options for Project Thresholds to Trigger De-risking Policy

Threshold	Benefits	Risks
Dollar cost of project	• Consistent across departments and project types	• Challenging to set the best threshold • Does not necessarily reflect project complexity
Physical size of project	• Consistent across departments and project types	• Challenging to set the best threshold • Different criteria would be needed for buildings and SFPUC pipelines
Allow departments to determine a threshold policy	• More flexible for departments • Departments deliver different scopes of work	• Not consistent across departments or project types • Departments could set the threshold too high or too low

Source: BLA analysis

Dollar cost of the project – either total cost, or construction costs – appears to be the most logical threshold and was mentioned frequently in interviews with department representatives. However, determining the best dollar threshold could be challenging due to the wide variety of costs of capital projects across the City. A threshold between \$50-\$100 million for the total project budget was suggested, although that range itself is wide and could potentially leave out whole departments that rarely, if ever, have projects that cost \$50 million or more. Therefore, the size of the threshold will determine the prescriptiveness of the policy: a lower threshold would incorporate more projects and lead to more de-risking activities being published, and potentially greater bureaucratic challenges to implementing the policy, while a higher threshold would include far fewer projects, but likely be much easier to implement. A flexible threshold would allow departments to decide on a project-by-project basis whether it is important to report on de-risking activities and this could be determined by the risk level of the project.

Publishing Location of De-risking Activities

The question of where to publish the list of de-risking activities performed will affect the implementation of this potential policy. Exhibit 4 below shows the different possible publishing locations and their accompanying benefits and risks.

Exhibit 4: Options for Publishing Location of De-risking Activities

Location	Benefits	Risks
Capital Planning Committee (CPC), Annual Checkpoint Meetings	- Existing project reporting processes - Centralized	- Would miss some projects, because not all projects go through CPC - Limited staff capacity - Increased burden on project managers to send list to CPC
Controller, City Services Auditor	- Existing quality controls for citywide services - Centralized - Sufficient resources	- Project audits are typically conducted after projects are completed - Increased burden on project managers to send list to Controller
Department of Public Works	- Existing citywide project management expertise & public recognition - Centralized	- Limited staff capacity - Increased burden on project managers to send list to DPW
Project sponsor's website	- Easiest to implement - Existing information hub for each project	- Not always publicly recognized as owner of project - Decentralized (may be difficult for the public to find)

Source: BLA analysis

Several department representatives, including those from DPW, indicated that publishing the information in a centralized location was the best idea as it would be easiest for the public to find, but that it would be much harder to implement the policy and there is no clear best centralized location. The Capital Planning Committee (CPC) makes sense to host the de-risking lists as an existing clearinghouse for capital projects, but it does not work with every major capital project in San Francisco and could therefore leave out some projects. The Controller's Office, similarly, is an existing

centralized City agency with guaranteed funding for the City Services Auditor,⁶ but it does not currently serve a function like this and might need to hire additional staff. DPW representatives were enthusiastic about the idea of the Department being the centralized publishing location, but they stated that they do not have the staff capacity to manage it and would need additional resources to do so. However, other department representatives, including representatives from smaller departments, indicated that the best publishing location for them would be on their own websites or on individual project websites. This option would ensure that the information is posted publicly without putting an additional procedural step on project managers that could result in project delays, which lead to increased costs. Further, Controller's Office staff stated that DPW or the City Administrator's Office would be good options as the new DPW will be focused solely on infrastructure and the City Administrator's Office already serves a central role in sharing practices and policies across the City.

Status Quo: No Published De-risking Activities Policy

The Board could choose to not implement this recommended policy on de-risking. Nearly every department representative we interviewed expressed hesitation regarding the usefulness of this policy and whether it would achieve its intended goals. The risk of not implementing the policy is that there would continue to be no citywide accountability mechanism regarding whether project sponsors de-risk their capital projects appropriately. However, the benefits of not implementing the policy include:

- **Existing department efforts:** Many departments we spoke with either already apply de-risking strategies to major capital projects or are in the process of improving them. The SFMTA and SFPUC, in particular, have re-examined their de-risking efforts in the past year and are working to improve them.
- **No additional bureaucracy or slowdowns:** The policy could become a cumbersome process that project sponsors must complete before moving ahead to the construction phase of a project, leading to further delays in schedule and increased cost overruns. Regardless of how it is implemented, the policy is another step that project managers must complete that will inevitably take time and cost money. Several department representatives were concerned that this would inadvertently lead to the very schedule delays that the policy is intended to avoid.

⁶ Charter Section F1.113, approved by voters through Proposition C in November 2003, established the Controller's Audit Fund with a baseline funding amount of 0.2 percent of the City budget to fund audits of City services.

Policy Options

Based the fieldwork we conducted, which included interviews with department representatives and a review of industry best practices, we did not find enough evidence to support the adoption of a policy regarding itemized assessments of de-risking activities for all major capital projects in San Francisco. Such a policy might be challenging to implement because of the variation in project management practices across departments and because of the wide variety of types of capital projects managed citywide.

However, the Board might choose to implement the policy because it could lead to the improved scoping of major capital projects, increase the accountability of capital project sponsors, and reduce potential project delays.

If the Board chooses to implement a policy requiring that project sponsors publish a list of de-risking activities performed before a project's construction phase, then we recommend that the Board consider the following as a *minimum* requirement at various project thresholds:

1. For projects with budgets of \$100 million or larger:
 - a. Instruct department heads to create an internal, written policy regarding which de-risking activities must be published.
 - b. Require that the list of de-risking activities be posted to the individual project website or, if one does not exist, to the sponsoring department's website.
 - c. Require the list be posted pre-bid (for projects delivered through the Design-Bid-Build method only⁷).
2. For projects with budgets between \$50-\$100 million:
 - a. Instruct department heads to create an internal, written policy regarding which de-risking activities must be completed prior to construction.
 - b. Require that departments incorporate the performance of the required de-risking activities into existing project management processes, such as DPW's Quality Assurance Quality Control Plan process.
3. Allow department heads to waive the de-risking policy requirement for projects with budgets of less than \$50 million at their discretion.

⁷ For Design-Build, CMAR, and CMGC projects, the list should be published before the construction phase; this would likely be after the Construction Manager is procured as the Construction Manager typically is brought on early in the design process.

Appendix A: Sample Risk Registers

T1 Program - Program Risk Register
Last Updated: 09.24.19
Rev: v029

■ Latest update will be on RED

ID	CAT	Risk Owner	Risk Title	Risk Description	Risk Effect	Comments / Updates	Prob	Impact	Risk score	Mitigation Actions	Action Owner(s)
T1P 020	Management	Todd Temple Kent DeRusha	Achievement of 18 Gate Opening - Stage 1 (T1C) - Stage 2 (BAB) Utility and Infrastructure	Critical infrastructure is required from T1C to support BAB for the opening of 18 gates. There is a risk that all the services and utilities required to open and operate 18 gates may not be available in the time period needed. Critical services required;- *HVAC * Power * Communication Systems / Telephone Systems * Fire Systems * DAS Co ordination and agreement required by both on who will be providing what and when along with agreement on distribution of costs.	1. Building will not be able to open on planned date (Jul 19) if solutions can not be identified or put in place in line with schedule. 2. Increased costs for temp solutions for utilities to keep to the opening date. 3. Further schedule delays if 9 Gate milestone is not met. - Works stage 1.5 , stage 2 and 18 gate opening. 4. Additional costs for delays and acceleration if required (possible). 5. Reputational Impacts for SFO if delays are incurred and have a knock on effect leading to further delays to the future milestones.	08.22.19 Currently tracking following pending items: - EFSO per discussion in BAB Risk meeting 04.23.19 - NH Das should have power by 5/17 04.11.19 - TherH21+H6:H8+H6:H9+H21+H6:H8+H6:H11+H6:H9+H6:H11+H6:H10+H6:H11+H6:H9+H6:H11	Very Low	Low	2	7. Regular Stakeholder Meetings. ONGOING. 8. MOU completed and in place. ----- 1. CJ Line activity map to be created and updated. COMPLETED. 2. Identification and incorporate the interdependencies between the projects with the creation of a detailed interface matrix (MOU) COMPLETED. 3. Identification of alternatives (temp infrastructure) to allow BAB to "go live" with 9 gates. COMPLETED. 4. (BAB) Action plans with each sub (CORE TRADES) - what they need and when. COMPLETED. - DUE END MARCH '18 5. Standing weekly interface meetings with both teams. (HP / AWJV). - Confirmation of Stakeholder buy in and agreements. Communications out to stakeholders to obtain buy in. COMPLETED. 6. Both contractors working together to create MOU as well as CJ Line Report. COMPLETED. - MOU due for completion - COMPLETED OCT '18 - 9 Gate plan submitted to BICE - COMPLETED.	Todd Temple Richard Sasser Kristi Hogan Henry Dumaran
T1P 003	Management	Todd Temple Kent DeRusha	Trade Labor Availability and Shared Labor Constraints	Due to the numerous projects currently ongoing at SFO as well as the SF and surrounding areas there is a risk that availability of specialized labor will be limited leading to the program not being able to meet schedule due to lack of man power. - Shared supervision / Alignment of trades and schedules. - Shared resources (trades) on T1 / BAB & Hotel/	1. Delays and Stoppage of works if resource if not available or numbers required can not be met. 2. Additional costs if labor has to be sourced outside of the California area. Additional costs for premiums on local labor. 3. Potential for schedule delays if both projects have same contractor doing work on each project. If one project is delayed it may knock the other projects schedule out as contractor will not be able to do the work as planned. 4. Potential for health and safety issues if strain is put onto workforce to meet extra shift requirements / acceleration	12.29.19 - AWJV & HP continue working with subcontractor community to evaluate craft needs to meet schedules and upcoming milestones. 08.27.19 - Need more man power out there (BAB). Man power is getting more consistent (T1C) 05.27.19 - Reduced the Risk impact from Medium to Low 04.11.18 - HP is on track now. Work balancing over time during past weeks. 12.05.18 - Risk reduced from P: HIGH / I: HIGH 09.24.18 - Meeting completed with AGA to understand & communicate where else on schedule is critical. T1/BAB more critical than hotel project. 07.02.18 - Risk has potential to start impacting in the next 6 months as more trades come on line with the increased activities planned. 04.30.18 - Discussed and agreed to leave at level. M. Taylor decided on score to be reviewed by whole team to confirm and agree scoring. P:H I:H = 16 01.22.18 - Note to understand what Snr. Leadership team would like to see in regards to trade labor & resource capacity. Possibility of a combined work resource schedule to be created that could provide a suitable answer. ----- NOTE: Risk will continue to Impact the project throughout its lifecycle. Due to market conditions this risk is not likely to be resolved.	Low	High	8	2. Look into obtaining specialist resource from out of state if required. ONGOING. - Resources have been brought in from other regions, i.e. Southern California, Nevada, East Coast. 3. Offering required resources premiums for accepting work or working weekends. ONGOING. 6. Confirm with all trades that any opportunities identified in action item 2 above, will be able to be support these requirements. ONGOING. 7. Forecast for trades to be combined T1C/BAB. ONGOING. - Due before wc 102918 8. Weekly plans show production rates that you we are expecting and have to be compared with the labor productivity we are getting. 8. Communication from Snr. Management in regards to shared labor and T1 Program's priority. ONGOING. ----- 1. Early identification of what resources are required and when to enable security of resources. COMPLETED. 4. Resource requirement histograms to be created in order to give insight and projections to the airport on trends and requirements of resources for program. COMPLETED. - Included as part of the monthly reports by both teams. - AWJV - Updated monthly. - HP - Updated monthly.	Todd Temple Kent DeRusha
T1C 011	Construction	Todd Temple Kent DeRusha	Misalignment of the construction interfaces at the CJ Line - Stage 1.5 (T1C) - Stage 3 (BAB)	STAGE 1.5 - HP STAGE 3- BAB The management of the construction interface points at the CJ LINE are required to be fully defined along with the scope, roles and responsibilities agreed between all parties. Clear management and coordination is required throughout the project to ensure no issues are encounter during construction.	1. BAB & T1C schedules may impact each other leading to unexpected delays or stoppage to works. - HVAC / PLUMBING	12.23.19 - Alignment between AWJV and HP for milestone system and support ongoing. 08.27.19 - Interface should be integrated. Scope needs to be coordinated between the two projects (BAB and T1C) 08.08.19 - As-built survey completed to verify stage 3 (BAB) and stage 1.5 (HP) grid alignment, per discussion on T1C Risk Meeting. 04.23.19 - Architecture misalignment has been resolved. There are still more connection at the CJ line at 1.5 and 3 stage. 03.18.19 - Finalize agreement @ CJ line required. Sitting with Wayne(BAB) to finalize agreement.	Very Low	Very Low	1	1. Clear communication and co ordination between both projects in regards to schedule and any potential schedule delays. ONGOING. 2. Co ordination meetings on all field activities. ONGOING. - Bi weekly interface meetings. COMPLETED. 6. BIM Model to understand confidence and clashes. ONGOING. 7. Who has the responsibility / What is the timeline? ----- 3. Creation and agreement of CJ Line Report - Roles, Responsibilities and Accountability defined. COMPLETED. 4. Identification of what is required and when. COMPLETED. 5. CJ Line activity map creation and updated accordingly. COMPLETED.	Todd Temple Kent DeRusha Andrew Miller Scott Stewart

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T1P 002	Construction	Todd Temple	Installation of the Baggage Handling System in field.	T1C has overall responsibility. Validation that system can be fully installed successfully in both the terminal building and BAB. Clear co-ordination of works of the installation of the BHS - including access to areas, systems and clearance.	1. Schedule delays if all systems can not be successfully integrated / operational in T1 and BAB. 2. Reputational impacts to SFO if baggage system does not operate correctly leading to issues with the operation of terminal and flights.	09.23.19 - Finish system installation on February 13, 2020. Team revisiting all the onstraints associate with BHS. 08.27.19 - Tadres work is affecting the ability to install baggage system (Deparrtture). Baggage system move forward with installation and other trades had to built platform to work over the baggage system (Arrivals). 08.08.19 - Baggage equipment installation has been affected by other trades, per discussion on T1C Risk Meeting. 04.23.10 - BHS installation have been going pretty good. Clear space clashes (around 2 or 3) have been resolved. 10.22.18 - Risk reduced to Low % as being mitigated out. - Not started installing in the South. Currently on track and reflecting current schedule. 01.22.18 No Stakeholder for BHS Maintenance - Who will sign it off? Beaumer maintain in first 3 yrs. currently neg. contract. - Clear space clashes not been taken to stakeholders. - Ongoing through till June '18. -----	High	High	16	1. Weekly co ordination meetings between T1C, BAB and BHS. ONGOING. 2. BIM modelling to understanding interfaces. ONGOING. 3. Escalation process for those clashes that can not be rectified. ONGOING. 4. Prioritization of clashes, identification of roles and responsibilities for rectification / communication. ONGOING. 5. Requirement of acceptance from stakeholders on those clashes that can not be rectified. ONGOING. 6. Monthly schedule review updates. ONGOING. 7. Pull planning for coordination	Ryan Louie Greg McCarthy Dave Promer Ruhi Thakur
T1P 018	Design	Suzanne Culin Kristen Allen	Late Stakeholder Requests - Stakeholder Scope Creep leading to Late Design Changes	There is a risk that there are late design changes requested by stakeholders that are required to be incorporated into the works. Scope changes due to being requested to add additional scope into project without the additional funds. Many small item increases. Agreement made for certain design that may not have been fully understood and is required to be changes. Proceeding with current design but there is a risk that on review (Mock Ups) or Opening there may be stakeholder dissatisfaction leading to changes to be made. * Artwork, Shared Use, Security Enhancements, Special Systems, Triangle Building * Issues arising from review of Mock Ups	1. Increased costs for changes to be made to design. 2. Schedule delays. 3. Clashes with what is currently being built and the final design if changed at late stage - integration can not be completed. 4. Stakeholder dissatisfaction and unknown consequences if solution / design does not meet the expectations of all.	08.27.19 - Updating team functional orchard base on commission, tenants, concessions, design and construction. 05.27.19 - No known issues at the moment but could become an issue as the installed and finished products are reviewed by DRC (and other SFO Stakeholders) and are required to change. 03.25.19 - Check projects GMPs to see if the design cost changes are an alternative or not.	Medium	High	12	1. Share the information as soon as possible to team members (PMSS and SFO PMs). 2. Continual engagement with stakeholders. ONGOING. 3. Understanding the impacts of late design changes and escalate when appropriate. ONGOING. 5. Obtain resolutions on incomplete designs and gain agreements with SFO stakeholders. ONGOING. 6. Any scope changes will be required to be endorsed by SFO PMs. ONGOING. 7. Any changes will need to be analyzed for cost and schedule implications before agreements are made. Sources of funding need to be confirmed. ONGOING. 8. One Open design list to be created. Weekly meeting being conducted for status updates. ONGOING. 9. GMP created and agreed by project and SFO to reduce the risk. COMP / ONGOING. -----	Franco Marinaro Milan Hanacek Farrah Young
T1P 005	Management	Kristin Allen	SFO Resource Availability - Approvals, Permits, Inspections and Commissioning	Approval process may not align with project timescales leading to project not obtaining required approvals to meet needed deadlines. Approvals may not be granted at all leading to design changes. BICE currently reviewing designs along with several other SFO projects. Inspection resources may not be able to complete tasks in line with program requirements. Stakeholder availability during commissioning if required with other projects SFO wide i.e. AVSAC Key resources : * ASO *ITT & Commissioning *Fire Dep * BICE	1. Inability to meet 18 gate milestone / opening. 2. Schedule delays including lost working days or stoppage of works if approvals are not required .	08.27.19 - Base on lessons learn, make sure exactly what is coming and what the priorities are to avoid any delay. 04.23.19 - BICE allowing us to respond to Bluebeam comments while session is open	Medium	Medium	9	3. Work with SFO Snr. Management when required to push any urgent submittals with BICE. Update and track histogram on a quarterly basis. ONGOING. - BICE histograms part of the monthly report 6. Clear communication and understanding of what is being asked = explanation to be given of history of design to those who are requesting changes etc. ONGOING. 7. Looking to see if (BAB) can get BICE resources and activities completed in APRIL in order to be ahead of the Hotel project. ONGOING. ----- 1. Prioritization of what approvals are required and when to be submitted to BICE. Raise any upcoming requirements as early as possible at weekly meetings. COMPLETED. 2. Both projects to create a consolidated prioritization list to help BICE work on both projects to allow for all works to carry on as per each schedule. COMPLETED 4. All designs completed in line with code. COMPLETED. 5. Commissioning schedule requested from HP & AWJV. COMPLETED - HP COMPLETED FOR STAGE 1	Kristi Hogan Ryan Louie Wayne Campbell John Withaker Paul Sipmson
T1P 022	Construction	Michele Charles	Construction of concessions and tenant space use for 18 Gate opening	There is a risk that the tenant and concession spaces create an impact on the delivery of the project on time * Late changes to design / tenant space * Schedule being delayed * Inability to meet deadlines	1. Increased costs if infrastructure is required to be re modelled to allow for tenant requirements.	08.27.19 - Airline spaces are critical. Logistic plan to follow up with tenant on HP side. 08.08.19 - Team is working with concessionaries for 18 Gate with time to avoid 9 Gate problems, per discussion on T1C Risk Meeting. 06.11.19 - Developing lessons learned approach - will discuss w/Franco Marinaro/ BAB and prepare for 18 Gates (when T1C concessions start their build-out; DRC wants changes to CDG. RFI's will not go out until 8/2019). 04.23.19 - Coordination efforts between team and tenants to help them with their schedule is ongoing . Latest construction date will be turn over day. 03.18.19 - A number of changes have been made by tenants already with a large list trying to be rectified at moment.	High	High	16	1. Working with stakeholders to understand requirements as early as possible. ONGOING. 2. Weekly tenant walks. ONGOING. 3. Monthly Concession Partnering meetings. ONGOING. 4. Working with tenants to fix any changes. Tracking items and changes. ONGOING. 5. Lessons learned to be used for every next stage to prevent / reduce chance of happening again. ONGOING. 6. Focus structuring of the team to focus resources on tenants and cosessions. 7. Logistic plan with schedule associated with it.	Henry Dumaran Franco Marinaro Design Phase: - John Whitaker - Wayne Campbell Site: - Efrain Zea - Richard Sasser
T1P 017	Construction	Todd Temple Kent DeRusha	Construction Site Safety Incident	A serious site safety incident occurs due to :- . Manpower constraints / long or extended working hours leading to fatigue of the crew. . Inadequate planning & management of construction activities. . Failure of Contractors to adhere to agreed construction method Statements and Risk Assessments. . Lack of training / supervision or lack of staff with the correct experience.	1. A potential risk of serious injury or fatality for: a. contractor or staff member b. member of the public 2. SFO reputational damage and significant media attention 3. Disruption to airport operations 4. Disruption to construction site - stoppage of works.	08.27.19 - See what are the differences on the existing tenant work letter vs the revise one 08.26.19 - No new updates. May 18 - Risk carried on register for reputation impacts.	Very Low	High	4	1. Continual site walks conducted by Site Supervisors and Construction Managers. ONGOING. 2. Ability to report any near misses or poor working practices. ONGOING. 3. Communication to work teams on a regular occurrence in regards to site safety. ONGOING. 4. HP / AWJV each have own crew on site for site safety / supervision. ONGOING. 5. All craft combined Safety orientation. ONGOING. 6. Monthly SFO wide meeting. ONGOING.	Frank Davis Bill Wallace Andrew Miller Scott Stewart

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T1P 007	Construction	Scott Bills	Management of the construction of the ITB Connector.	Management of the impact on tenants while maintaining schedule during construction. * Closure of A1. Management of stakeholder expectations.	1. Changes to design and construction methods may lead to increased costs to project. 2. Potential for reputational impacts if no solution can be finalized that meet all stakeholder requirements.	08.26.19 - No new updates. 04.23.19 - There are temp walls on "ITA" site for all levels. 03.18.19 - Will remain a risk until the work around Air France lounge is completed.	Very Low	Medium	3	1. HP currently working through potential options to present to Aviation Management. ONGOING. 2. Aviation Management to make decision on what options to take to Air France stakeholders to obtain agreement. COMPLETED. 3. Stakeholder communication and management. ONGOING.	Todd Temple Kristi Hogan
T1P 029	Construction	Kristin Allen	Unplanned disruption to airport operations	Due to the project operating alongside live taxiways, runways and parking stands during its lifecycle there is a risk that if the works are not planned and managed correctly there is a potential to disturb or stop airport operations.	1. Schedule delays. Minor delays to significant delays . Worst case - complete site shut down. 2. Reputational impact - Customer dissatisfaction - Travelers and Businesses. Stakeholder dissatisfaction - Operations, Airlines.	08.26.19 - No new updates. 04.23.19 - There haven't occur any significant incident NOTE: This is an objective of the Partnering Charter.	Very Low	High	4	1. Site logistics coordination meetings with airfield ops. ONGOING. 2. Contractors to provide site work plans and site safety plans that will be reviewed and approved before work starts. ONGOING. 3. Ongoing site safety / operation meetings to discuss planned works so all know what is happening on site on a daily basis. ONGOING. 4. Detailed scheduling, phasing and logistical planned. ONGOING.	Todd Temple Kent DeRusha Kristi Hogan
T1P 021	Management	Ryan Louie Michele Charles	Integration of all SFO construction projects.	There are multiple projects being undertaken airport wide. An understanding of how each project impacts on the T1 Program is required to avoid any potential schedule delays or limited resource. 01.29.19 - Resource from TKS across multiple projects on the SFO Campus. Prioritization of activities for 9,18 and 25 gate milestones required to be completed by them.(Resolved)	1. Inability to open terminal without full transportation requirements. 2. Schedule delays if other projects are delayed and same sub contractor is being used on multiple jobs within the airport. 2. Prioritization of other works may be made leading to schedule delays for the program. 3. Increased costs.	08.27.19 - Make sure that other SFO PM's, Nat and stakeholders know what impacts we got going on; in order they can understand where the project stand. 08.26.19 - No new Updates 01.28.19 - Issue arising with Tisen Resources being used SFO Campus wide and may not be able to meet all requirements for all projects in line with each project schedule.	Low	Low	4	1. I identification of all projects at SFO and understand how each will impact the program. PROPOSED. 2. Work with other projects to identify if can work together for delivery of materials and use of resource? PROPOSED.	Jeff Fredericksen Cristine Mcgeever (TKS ACTIONS)
T1P 006	Construction	Todd Temple Kent DeRusha	Production rates and quality of work	Due to limited availability of resources throughout all trade labor, there is a risk that subcontractors may not be able to achieve planned production rates that is expected leading to potential delays and/or quality issues.	1. Schedule delays as contractor may not be able to work to expected production rates or completely understand working methods within an airport environment. 2. Quality issues with end product if not inspected sufficiently.	04.23.19 - Poor quality and efficiency of the work force for certain traits. Workers sent by the unions are not the most qualified. 03.18.19 _ Electrical had been causing concern -BAB meeting with SFO to discuss 01.28.19 - Interdependency links and risks between projects	Medium	Medium	9	1. Evaluation and validation of previous works completed by sub contractors. ONGOING. 2. Contact language to fully detail requirements. PROPOSED. 3. Escalation process when appropriate for any known issues. ONGOING.	Todd Temple Henry Dumaran
T1P 036	Construction	Kristin Allen	SFO Logistics -Site Logistics	Site Logistics and restraints (space, access and time) SFO Resources, changes and space allocation effect the projects schedule	1. Delays to schedule of works if planned access routes are changed with either longer durations to get to site or if alternative solutions are not are remedied in adequate time	03.18.19 -Site logistics are ok at moment. Moving into stage 1.5 and 3 risk should be reevaluated.	Low	Low	4	Accept the risk and mitigate as and when changes happen. 1. Use of Plot 16D - Provide plant schedule update. - Plot 16d = Golden Gate to move in Jan 19. CONFIRMED.	
T1P 038	Design	Kristi Hogan	Mock Ups - Timely delivery and decision making in line with project /program schedule	The various mocks required by both projects are required to be delivered in a timely manner to allow for the appropriate reviews and approvals granted by SFO in order to make relevant changes where needed and not delay the schedule. There is a concern that first in place may not be a viable option as if not accepted then there will may be significant schedule impacts and cost increases. The more specialized the mock up the more difficult it gets if schedule slips or if changes are required. * Restrooms, Terrazzo, Lighting, Furniture	1. Schedule delays for delivery of materials if approvals are not granted in preferred timescale and changes are required. 2. Significant schedule delays if any changes in materials are to be obtained from outside USA and have a long lead delivery timescale. 3. Delay to opening if certain areas that are required for opening are not completed due to changes in design or late approval 4. Increased costs for any changes in design or to absorb any schedule delays.	09.23.19 - There is a concern with the entry vestibule mock up. HP and Gensler are working on a proposal and how we can evaluate the entry vestibule without having it completely constructed. 08.22.19 - Major Pending Mock-ups: BAB 1) Lighting at End of Pier 2) Children Play Area 3) Pet Relief Graphic No changes to finishes and restrooms. 04.19.19 - Acoustical Metal pan/Panel ceilings change color with light. It is unknow if is the product or the installation. 04.10.19 - Identify mock up for 9 and 18 Gate. Prioritize mock up for 9 gate due to its soon opening. 03.18.19 - Currently missing Mock Up Due Dates for delivery and acceptance timeframes. majority of remaining mock ups are on T1C side. To be spoken about at B2B on 03.20.19 01.28.19 - Mocks ups nearly complete for BAB. Mock ups left for T1C only.	Medium	High	12	1. Revise and understand what the dates for all the mock ups where in baseline schedule. - HP currently revisiting dates in schedule and working with field team to gain better understanding of delivery dates. 2. Identification of mock up list that are the most critical / concerning and escalate where necessary to inform all stakeholders of impacts if not approved in line with schedule. 3. Communication to all SFO stakeholders that some approvals may require a quick turnaround if there is any delay previously of delivery of material required to create mock up. 4. Clear communication from GC to PMSS to advise of any potential delays to the completion of mock up especially if on the critical / concern list. 5. Mock Up meeting being conducted weekly. - Attended by each stakeholder who grants the approval.	Scott Stewart Todd Temple Andrew Miller Troy Jamie Coleman
T1P 041	Commissioning	Kristi Hogan	Limited activation Period for T1 Center - 18 Gate	Very limited scheduled period for activation in Schedule. SFO Stakeholders and CAS Team not having enough time for Activation activities. Access Control doors a major risk item.	1. Can not start the activation sequence in line with schedule leading to delays in opening. 2. Unable to open on the scheduled date. 3. Reputational impacts for SFO - Impact of Passenger experience 4. Operational impact - inability to operate a fully functional building.	08.26.19 - No new Updates '05.21.19 - Systems not being ready in SSR room on T1C for IST. 05.10.19 - The updated plan to conduct ISTs and other activities before TCO, is slipping in terms of Schedule. Prime reason is systems not being ready. T1C NBO SSR remains to be a concern. '04.23.19 - HP action is to go back to 10 days activation period. '03.18.19 - Tight window to work with. Currently investigating to bring back to 10 day period	High	Medium	12	1. Clear understanding of commission activities by PMSS. ONGOING. 2. Decoupling commissioning activities from TCO and executing as many activities before TCO as possible to virtually extend the activation period. ONGOING 3. DB to understand commissioning activities required and add into schedule for North Bump Out. ONGOING.	Ryan Ronhaar Todd Temple John Whitaker Liam Kimble

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T1P 042	Commissioning	Kristi Hogan	Doors and Access Control	There is a large amount of items required to build / deliver each door. There is a large amount of doors that are required to be turned over in a limited / constrained timeframe. If not adequately planned for, accounted for and an accurate schedule of works there is a risk that all doors / access control may not be available in line with opening schedule. Co ordination for construction access and door turn over from landside / airside.	1. Inability to fully open at 18 Gate due to issues with access or secure locations. 2. If Hardware is not in place - doors can not be keyed in time - additional costs and /or Schedule delay * Hire Security Resources for all doors not keyed - Additional costs not in estimates * Work overtime to complete works - Additional Costs not in estimates * Resource allocation and availability - Schedule Delays * Other activities may be pushed back leading to schedule delays	12.23.19 - AvSec requesting what is not on the security door signange standards - HP. 09.23.19 - Actively finishing doors and tracking quantities. 08.27.19 - Matrix of doors for 18 Gates that are going to be commission has been requested. AVSEC doors vs Non-AVSEC doors and which ones will be required. 08.26.19 - No new Updates 05.21.19 - Commissioning process is not the bottleneck; correct installation, do it on schedule and furnish of doors are the bottleneck 05.21.19 - As of today, no Access controlled door has been accepted by AVSEC. Testing 14 doors needed for fence move on 05.23.19. 03.18.19 - No clear or detailed plan received @ Ramp level. Awaiting the finalization of plan - looking to complete 1 combined plan for both projects. Understanding of what doors are required and fence plan for 9 gate. 01.28.19 -Currently late delivery of doors from manufacturer to site that is causing issues. 01.09.19 - No schedule from contractor. Awaiting Access	High	Very High	20	1. White paper has been sent to the team 2. Austin Webcor is adding sample doors photos to help the process. 3. CAS to use the SFO-wide inter-project meetings to coordinate and streamline the commissioning process for AVSEC and Projects. ONGOING 4. D/Bs to put more efforts into pre-tests for Door turnovers and better QA/QC with a goal to get Doors approved in the first go itself. ONGOING 5. Access Control Plan from HP for 9 Gate turn over required. ONGOING 04.22.19 still awaiting these. 6. 06.28.2019 - AVSEC accepted that the 91 doors on BAB and the 10 doors on T1C for the 9 -Gate activation will have only one security camera for the moment. It is required that each door have three security cameras pointing the way to any door access for the entire project.	Todd Temple Kent DeRusha
T1P 044	Commissioning	Kristi Hogan	Systems not ready for commissioning activities	If Systems are not activated per the scheduled dates, there is a risk that the full commissioning and activation process is incomplete or not completed correctly and adequately. Delays may be encountered due to - * Outstanding Permits / Approved Permits * Failure of systems during testing and commissioning - Incorrect system installs or check list not being followed / completed leading to failure of systems. * Trade quality plans not being followed. * Integration of any scope gaps * Condensed Schedule * Late design changes once construction has started - Stakeholder changes	1. Not have a fully functional boarding area. 2. Reputational impacts and customer dissatisfaction (Customer experience impacts) - Poor operations, ill trained staff	08.27.19 - Are other things that are affecting TCO or how impact other things? 08.26.19 - 18 Gate BAB TCO - Feb 5, 2020 18 Gate T1C TCO - Feb 11, 2020 06.28.19 - Ramp operations IST and test fits were completed the last week on June. 05/21.19 - Ramp Operations IST and Test Fits delayed by a month. This issue is a major concern. 05.10.19 - New PLC system, being installed by CEI, a concern because its schedule extends very close to the 9 Gate Opening. The very crunched schedule of Commissioning and Activation limits the probability of any correction or errors. 04.16.19 - CAS activities related to ramp operations, which is considered most crucial and most complicated are at highest risk due to certain systems not being ready. 11.27.18 - If either of the projects have prolonged delays prior to handover to CAS team there is a risk that there will not be adequate time for the CAS team to complete all	High	High	16	1. Actively tracking of Activities. ONGOING. 2. Creation and management of Issue Log. ONGOING. 3. Manual Operations as fall back plan. PROPOSED. 4. Implementation of functional areas early. ONGOING. 5. Early inclusion stakeholders during testing and commissioning to reduce impact of delays. 6. Both contractors (AW & HP) are including in their schedule commissioning activities.	
T1P 048	Management	Suzanne Culin Kristen Allen	Management of Stakeholder Expectations - 18 Gate Opening	There is a risk that what is being delivered and handed of for operation is not aligned to the expectations of stakeholders.	1. Schedule delays due to changes being requested by stakeholders or areas/items not being signed off and accepted in timely manner. 2. Reputational Impacts - Pax Experience Impacts	08.27.19 - Get arms around with party planning to prevent any surprises. 08.26.19 - No new updates 03.19.19 - Areas of Advertising in terminal - Clear channel for locations for Ad @ 18 gate - may require a walk through with Clear Channel Stokehold. 01.28.19 - * It is known that there is a history of misalignment between expectations, understanding and what is delivered. * REACH Committee - Potential differing expectations to what is delivered.	Low	Medium	6	1. Weekly Executive meetings and Site Walks to visualize progress and delivery. PROPOSED - will have the ability to complete site walks with key stakeholder groups from April 19. Walk stakeholders by groups to gain better understanding and visualization. 2. Early communication of issues / concerns to higher levels / Senior Management: * Creation of Steering committee that will allow for the escalation of issues early to Senior Executives in order to rectify. ONGOING. 3. Identification exercise to be conducted to gain understanding of stakeholders expectations of what is being delivered. - Learn from previous projects (Lessons Learnt) as this has been highlighted as a previous issue on several projects. 4. Stakeholder meetings when required to communicate the scope being delivered for 9 /	Kristen Allen Suzanne Cullin
T1P 046	Management	Suzanne Culin Kristen Allen	Changes to Schedule Procedures	There is a risk that the planned changes to the schedule process , procedures and systems will negatively effect each project due to :- 1. Time required to agree, procure, implement and train members of team on new system 2. New technology and process being introduced 3. Learning curve for using new process and programs 4. Ability for all team members to access program / system when required	1. Addition on costs to project :- a. New software required to be procured that is not in project budget b. Delays to project schedule to incorporate procurement of software, implementation and training of all members of team required to use process and system c. More labor intensive - requirement of new resources that were not forecast in current budget 2. Schedule delays due to implementation of new process and procedure along with time taken to implement that has not been allowed for in the schedule.	04.23.19 - Working on last planner	Low	Low	4	1. I identification of best software to be used and costs. ONGOING. 2. Communication at the Builder 2 Builder on progress. ONGOING. 3. Coordinate teams and understand schedule and activities. ONGOING.	Todd Temple Kent DeRusha
T1P 047	Construction	Kristin Allen	BHS Obstructions	There are a number of obstructions with the BHS in regards to the Clearance zones and maintenance zones. Currently working through the list of items to try and rectify / fix. There is a risk that some obstructions may not be able to be accepted.	1. Inability to complete maintenance. 2. Changes required that may cause time or cost implications.	08.26.19 - No new updates	Low	Low	4	1. SFO buy in required for those obstructions that can no be fixed. ONGOING.	Art Lau
T1P 048	Construction	Kristin Allen Michele Charles	Time between TCO and concessionary	There is a risk that tenant staff won't have physical accessibility to the new Boarding Area B	1 . Inability to train tenant's personal to operate new concession spaces. 2. Lack of customer services to airport passenger.	08.26.19 - 18 Gate Concessions TCO - Mar 2, 2020	Low	Low	4	1. Team is working with concessionaries to know how their schedule is going.	Richard Sasser

ID	CAT	Risk Owner	Risk Title	Risk Description	Risk Effect	Comments / Updates	Prob	Impact	Risk score	Mitigation Actions	Action Owner(s)
T1P 049	Management	Suzanne Culin Kristen Allen Ryan Louie	Wayfinding - New Signage Around Airport leading to changes of signage at Terminal 1 project	Signage at new Terminal 1 pre and post security needs to be updated to support airport new signage infrastructure	1. Additional costs for any claims and change orders submitted. 2. Potential delays to schedule if changes and change orders are required. 3. If changes are required to be made after design complete there is potential for additional costs for any redesign elements or may impact construction schedule if any changes have to be made before opening and interact with construction activities. 4. Any changes may be required to go through BICE to receive an addendum to architecture design package.	08.27.19 - Notice of relocation in advance indicating wherever they are going to be. Put a warning in advance on website to notify people where to go. 08.26.19 - 90% completed on punch list for 9 Gate 06.28.19 - Who is working on pre-security signage? 04.23.19 - Wayfinding team pick up the scope to address the gate numbers and change all of them around the airport. Any signage that touches the terminal 1 project is the terminal 1 scope.	Medium	Low	6	1. Design, scope and information needs to disseminate quickly enough for signage fabrication. 2. Post security signage completed by BAB for 9-Gate. 3. 18 Gate - Double check with PMSS team to run over through all drawings for any changes.	Todd Temple Kent DeRusha
T1P 50	Commissioning	Todd Temple	Baggage Handling System testing at 18 Gate	1. Out of flow on the commissioning schedule.	1.Significant schedule delay for commissioning during 18 Gate	08.26.19 - It was communicated that there is zero float on commissioning schedule., per discussion on T1C Risk Meeting.	High	High	16	1. Late stage testing 2. TSA requirements on test script for their acceptance / approval 3. Airport / Airlines expectations and acceptances	Dave Promer David Delaney
T1P 51	Construction	Todd Temple Kent DeRusha	Staging Area	1. Staging areas for the T1 project are very limited. 2. There is a risk to the project if staging areas are not maintained during the duration of construction, because there could be added costs related to material handling and/or off-site storage.	1. Significant delays for delivery of materials.	12.23.19 - Aviator lot is being using for material staging for BAB and T1C.	Low	Low	4	1. Space adjacent to Super Bay Hanger will be use for T1C project for staging /storage area.	Andrew Miller Scott Stewart
T1P 52	Construction	Kristin Allen Ryan Louie Michele Charles	Staff and labor parking limited capacity cost implications.	1. Requirement of increased numbers of parking spaces. Site logistics mean there are limited number of spaces with Core Trade workers required to have parking to be a certain distance from site. 2. Numbers of people on site will fluctuate throughout the project lifecycle. Issues may arise if spaces required are not accurately forecast leading to a potential threat that spaces may be re allocated to other projects within SFO.	1. Increased costs if on site parking for specified trade workers can not be allocated. 2. Inefficiencies generated by dwell time for travel to and from remote parking. 3. Potential for SFO to reduce number of spaces if what is requested is not utilized reducing the number of spaces available.	12.23.19 - Parking passes that had not been used in 90 days are being deactivated without notification. Contractors expects that more passes will be made available if the need arises. '08.08.19 - Airport provided central garage parking for the electrician. There won't be additional cost for parking. '05.09.19 - Frustrated workers because SFO do not provide an appropriate parking spot '-----	Medium	Medium	9	1. Communication at regular periods (OACmeetings) on the importance of forecasting as accurately as possible. ONGOING. -----	Andrew Miller Scott Stewart
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WW-662R POWER FEED & PRIMARY SWITCHGEAR

SFPUC

PROJECT: WW-662R

(Original Contract Value:\$30,744,200; 1125 Days, NTP: 10/05/2020, Final Completion: 12/18/2023

Status Update:
2/10/21

CONTRACTOR: Blocka Construction Inc.

Report Cut-off Date: 7/31/21

Updated By: JG &
AV

Project Team: WW-662R CM Team

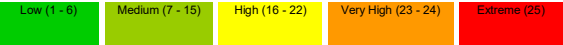
PROJECT CM: Joseph Gallardo

PROJECT RISK REGISTER

CM
CONSULTANT: N/A

Date Key:

Risk Score Key:



1. Trigger Date (Column K) within 30 Days

1. Action Start Date (Column Z) Overdue and Action Status (Column AC) is Proposed

2. Expiration Date (Column L) within 30 Days

2. Active Action End Date Overdue (Column AA)

3. Action Start Date (Column Z) within 90 Days

3. Open or Mitigated Risk Expiration Date (Column L) Overdue

4. Active Action End Date (Column AA) within 90 Days

4. Risk (Column B) with Last Active Action Overdue

5. Open Risk Has Actions All Completed

6. Action Status (Column AC) is Active but Action Start date (Column Z) is in the future or Action End date (Column AA) is in the past

7. Action End date (Column AA) is greater than Expiration Date (Column L)

RISK IDENTITY & CAUSE												CURRENT ASSESSMENT										MITIGATION							
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	
													Cost Impact			Time Impact													
Rank	Risk ID	Risk Category	Risk Description (Hazard/Risk Scenario)	Project Title	Location	Cause	Effect	Risk Plan Owner	Risk Status	Trigger Date	Expiration Date	Probability of Occurrence (P)	Min	Most Likely	Max	Min (Days)	Most Likely (Days)	Max (Days)	Risk Score	Scoring Rationale	Strategy	Risk Plan	Action Items	Action Owner	Action Start	Action End	Actual Completion	Action Status	
	8088	Management	Challenges in coordination with multiple projects including Headworks	WW-662R	SEP 892/032	Limited Site with multiple projects. Unable to accelerate schedule	Blocking access	PM	Open	6/16/2021	12/18/2023	85%	\$150,000	\$300,000	\$450,000	30	60	90	Extreme (25)		Mitigate	Coordination	10744 - Request ahead of time notice from CM Management	CM	6/16/2021	12/18/2023		Active	
2	8087	Operations	Limited Area Challenges: Spills, Damaging existing Equipment (Generator, piping, and tank)	WW-662R	SEP 892/032	unable to use Road B	Damages, Spills causing delays and additional costs. Violation Fees. Impacting processing of sewage for WWE	Undefined	Open	6/16/2021	12/18/2023	85%	\$100,000	\$250,000	\$10,000,000	14	30	180	Extreme (25)		Mitigate	Coordination	10743 - Coordinate with the Contractor. Indicate importance of cautious through SCR or Email	RE	6/16/2021	12/18/2023		Active	
3	8084	Delays	PG&E Coordination issues causing delay for 12KB metering section	WW-662R	SEP 892/032	Schedule availability of PG&E Representative. The unavailability of Potrero service (DB-130) and the 12kv outdoor metering	Commissioning of Bldg. 032, switchgears and substations.	RE	Open	1/8/2021	12/18/2023	15%	\$300,000	\$600,000	\$1,150,000	60	120	230	Medium (12)	Will impact the transfer of the existing to the new 12KV metering for 6mos. Max. LD=5k/day	Mitigate	Coordination	10740 - RE to coordinate with SFPUC Power Enterprise	PUC	2/12/2020			Active	
4	8086	Regulatory	ADA Compliance changes	WW-662R	SEP 892/032	New Regulation	Possibly external elevator	PM	Open	6/16/2021	12/18/2023	35%	\$100,000	\$250,000	\$1,000,000	14	30	180	Medium (11)		Mitigate	Coordination Meeting	10742 - Architect (Fara Paris) to provide details as them become available	RE	6/16/2021	12/18/2023		Active	
5	8089	Delays	Weather Delays	WW-662R	SEP 892/032	Unable to perform inspection. Unable to weld due to high wind	Additional delays and Costs	RE	Open	6/16/2021	12/18/2023	35%	\$5,000	\$15,000	\$35,000	1	3	7	Low (6)				-						
6	8083	Delays	WWE SCR Approval Method and Demands	WW-662R	SEP 892/032	Submission of SCR, approval methods and demands	Completion of field works and delays	PM	Open	10/13/2020	12/18/2023	15%	\$50,000	\$100,000	\$200,000	10	20	40	Low (13)	It will delay the project for a maximum of 30 days. LD=5K/day	Mitigate	Coordination Meeting	10739 - Attending SCR Meeting, and providing supporting documents.	PUC	10/13/2020	12/18/2023		Active	
7	8085	Delays	Short Circuit Study Delays	WW-662R	SEP 892/032	Design Engineer incomplete load requirements to perform the short circuit study as specified	Submittal process and review. Procurement of switchgear and electrical cabinets/equipment	RE	Open	2/12/2021	12/18/2023	15%	\$0	\$100,000	\$200,000	0	0	0	Low (13)	BCI COR claim of \$199,892	Mitigate	Coordination Meeting	10741 - Coordination meeting with the design engineer and complying with the milestone requirements per Specs section 26.05.73_01.11.00.	RE	7/19/2021	12/18/2023		Active	