Top Risk Summary

Focus: Summary of Top Risks from Oct. 2019 Risk Update, for Review with HART Board POC

HART Board POC Meeting Date: December 5, 2019
Agenda

1. Results of Recent Risk Updates (October 2019 Risk Update)
   a. P65 Cost
   b. P65 Schedule
2. Threat Diagram
3. Top Cost and Schedule Risks, October 2019
4. Top Risk Threats (cost increases), and Mitigations
5. Top Risk Opportunities (cost reductions)
   See “Summary of Top Risks on the HART Project” for further detail
6. Risk Mitigation Opportunities
7. Questions
Results of Oct. 2019 Risk Update, P65 Cost

Direct Risk Expected Value = $464 M
Risk Mitigation is the Goal!

Risk Mitigation is accomplished when a risk’s Pre-Response score is moved from the red area in the Threat Diagram (high probability of the risk occurring, resulting in a high Impact) to the green area in the Post-Response Threat Diagram (low probability of the risk occurring, resulting in a low cost or schedule impact).

Risk Scores:
- VL = Very Low
- H = High
- M = Moderate
- L = Low
- VL = Very Low
- $ = Relative Cost
- T = Time (Months)
Top Cost and Schedule Risks, Oct. 2019

**Top Cost Risks:**
- ROW
- Utilities, and underground conditions
- Core Systems (until assigned to P3)
- Affordability Cap being exceeded
- Environmental
- Archaeological
- Management Capability and Capacity (staffing levels to ROW acquisitions and CCUR oversight)

**Opportunities:**
- CCUR opportunity to eliminate unnecessary utility relocations with guideway shift
- P3 competitiveness, innovation for CCGS

**Top Schedule Risks:**
- Same categories as Cost
- Procurement timeframe
- New: Design timeframe and third-party approvals if required for new utility relocation plan

**Opportunities:**
- CCUR opportunity to save time by eliminating unnecessary utility relocations, particularly the 42” water main along Dillingham
183 Active Risks, Breakdown by FTA Risk Category:

- Construction, 94 Risks, 51% of total cost risks
- Design: 24 Risks, 16% of total cost risks
- Management Capability and Capacity, 10 Risks, 4% of total cost risks
- Market, 16 Risks, 10% of total cost risks
- Requirements, 39 Risks, 19% of total cost risks
<table>
<thead>
<tr>
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<tr>
<td>T1</td>
<td>Real Estate/Right-of-Way Acquisition ROW 60.01_01</td>
<td>Value of property acquisitions necessary for Rail could be higher than anticipated based on outcome of negotiations and/or court rulings.</td>
<td></td>
<td>HART continues to negotiate in good faith with property owners. Appraisals and due diligence through the courts have been supporting HART’s position in obtaining necessary ROW at a reasonable cost.</td>
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<tr>
<td>T2</td>
<td>City Center Utilities DBB511 SIT 40.02_02</td>
<td>Cost to deal with underground conditions could exceed contract allowances.</td>
<td></td>
<td>The CCUR team has determined that as part of utility relocations work, additional costly jet grouting will be needed along Dillingham due to geotechnical conditions. The CCUR team continues to explore the most cost effective ways of dealing with the geotechnical conditions along Dillingham.</td>
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## Top Risk Threats (Cost Increases), Oct. 2019 - Continued

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<td>T3</td>
<td>Core Systems Contract DBOM920 SYS 50.01_12</td>
<td>Risk of additional work needing to be performed by the Core Systems Contractor (CSC) following the recent settlement, through the time that the CSC is assigned to the P3.</td>
<td><img src="image" alt="Impact Diagram" /></td>
<td>HART’s Core Systems oversight team is working to troubleshoot systems interface issues with west guideway and stations construction in order to avoid further costs to the CSC due to changed conditions. The plan is for 2-phase testing at the platforms in order to start the first phase while the electrical conduit and wire is run within the canopy arms, then the second phase of testing will begin.</td>
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<tr>
<td>T4</td>
<td>City Center Guideway and Stations Group P3-550 PRO 80.01_07</td>
<td>Risk of affordability cap being exceeded for the capital construction and/or the future operations and maintenance of the system, resulting in more time needed for the PLO(s) to respond.</td>
<td><img src="image" alt="Impact Diagram" /></td>
<td>HART will have an affordability cap for capital construction and for future O&amp;M. If PLO(s) cost indications are too high, but are reasonably close, HART can mitigate the difference through scope adjustments. This scenario would likely take several additional months in the procurement process.</td>
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<td>T5</td>
<td>Airport Guideway and Stations DB450 SIT 40.02_11</td>
<td>Time Impact Analysis, cost impact alleged for delays to the Design-Build Contractor due to HECO Zone 8 work delays</td>
<td><img src="chart1.png" alt="Impact Chart" /></td>
<td>HART is evaluating this TIA and negotiating based on concurrent delays in this work area.</td>
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<tr>
<td>T6</td>
<td>City Center Guideway and Stations Group P3-550 SIT 40.05_02</td>
<td>Potential for CCUR work to extend beyond Access Dates committed to the P3 for CCGS construction</td>
<td><img src="chart2.png" alt="Impact Chart" /></td>
<td>The P3 procurement documents include a list of Access Dates for completion of CCUR work that HART is committing to meet. The Access Dates are currently undergoing a thorough schedule review by HART so that the dates promised will be realistic and achievable.</td>
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<td>T7</td>
<td>City Center Guideway and Stations Group P3-550 GUI 10.04_01</td>
<td>Discovery of unanticipated archaeological findings could result in added cost and schedule impacts to HART, beyond the base values the P3 will be expected to cover.</td>
<td><img src="chart1.png" alt="Impact Chart" /></td>
<td>HART has established language in the Procurement that will require the P3 to price this risk reasonably, but not so high that it would unreasonably drive up the P3’s cost proposal. HART wishes to incentivize the P3 to save money while fully respecting the proper ways of dealing with archaeological discoveries.</td>
</tr>
<tr>
<td>T8</td>
<td>City Center Guideway and Stations Group P3-550 SIT 40.03_02</td>
<td>Environmental cleanup and cost impact to HART. Environmental cleanup will likely have a cost impact to HART beyond what the P3 is to include in the Contract for each occurrence.</td>
<td><img src="chart2.png" alt="Impact Chart" /></td>
<td>This is the cost portion of the risk. HART is considering a Procurement strategy where the P3 would pay for a designated percentage of the cost and schedule impact up to a set amount per occurrence. This risk can be mitigated with advance drilling and testing for contaminated materials in the P3’s Early Works Package. Any contamination encountered could be described to the P3 concerning how to take care of the cleanup per previous discussions and agreements with oversight agencies.</td>
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<td>T9</td>
<td>Real Estate/Right-of-Way Acquisition ROW 60.01_17</td>
<td>Parcel scope changes for Mauka entrance to Downtown Station</td>
<td><img src="image" alt="Impact Diagram" /></td>
<td>HART and DTS have been evaluating the preferred Mauka entrance location for the Downtown Station. Discussions have been underway with property owners to find an agreeable solution and reflect the requirement within the P3 procurement.</td>
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<tr>
<td>T10</td>
<td>Real Estate/Right-of-Way Acquisition ROW 60.01_14</td>
<td>Partial take of a property along Dillingham could result in schedule delay to the project if the property is not acquired in time.</td>
<td><img src="image" alt="Impact Diagram" /></td>
<td>HART has been pursuing this particular property acquisition. The property is needed by June 2020 in order to complete the CCUR work in the area and to keep the P3 on schedule. If there are further delays, then it will become very expensive since the P3 work will be delayed.</td>
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<tr>
<td>T11</td>
<td>City Center Utilities DBB511 SIT 40.02_03</td>
<td>Utility abandonment: HART may not be able to abandon all utilities in place, and may have to fully remove them as the new utilities are installed.</td>
<td><img src="chart1.png" alt="Impact Chart" /></td>
<td>HART is working with individual utility companies and oversight agencies including HDOT and City DPP to only remove conflicting utilities, and to grout and abandon-in-place the remaining utility sections. Recent discussions with program partners have caused HART to increase this risk value in the Post-Response section.</td>
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<tr>
<td>T12</td>
<td>Real Estate/Right-of-Way Acquisition ROW 60.01_10</td>
<td>Acquisition of property necessary for the Downtown Station may result in a cost and schedule impact to HART due to suspected soil and groundwater contamination on the site.</td>
<td><img src="chart2.png" alt="Impact Chart" /></td>
<td>HART had been pursuing access in order to conduct a Phase 2 Environmental Review due to suspected soil and groundwater contamination on the site. However, the current plan is to avoid the HECO site altogether.</td>
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## Top Risk Opportunities (Cost Reductions), Oct. 2019

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<td>OP1</td>
<td>City Center Guideway and Stations Group P3-550 SIT 40.05_01</td>
<td>Opportunities for P3 Innovation through Alternative Technical Concepts (ATC’s).</td>
<td>![Savings vs Increase Impact Chart]</td>
<td>HART plans to evaluate and approve ATC’s that are beneficial to the Project. There were ATC’s that were received for previous HART projects, so there is precedence for this possible savings.</td>
</tr>
<tr>
<td>OP2</td>
<td>City Center Utilities DBB511 SIT 40.02_15</td>
<td>Continue to find opportunities to eliminate unnecessary utility relocations based on results of potholing which is identifying specific utility locations, and ability to shift planned locations of guideway foundations (shafts).</td>
<td>![Savings vs Increase Impact Chart]</td>
<td>The CCUR team has identified significant savings to date. There is a reasonable probability that additional savings can be realized which should provide sufficient contingency with the CCUR contract to address further unknowns that will need to be dealt with as City Center utility relocations continue.</td>
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<tr>
<td>Op3</td>
<td>City Center Guideway and Stations Group P3-550 PRO 80.01_02</td>
<td>Opportunity for P3 to present a modest cost reduction for construction of City Center Guideway and Stations, and remaining Core Systems work.</td>
<td><img src="savings_increase.png" alt="Impact Diagram" /></td>
<td>HART has been working to make the RFP as performance-based as possible so that it allows creativity from the P3 team(s). This opportunity risk assumes a 50% Probability of a 2% to 6% capital cost savings due to P3 competitiveness compared to the base estimate.</td>
</tr>
<tr>
<td>Op4</td>
<td>Pearl Highlands Garage and Transit Center P3-275 PRO 80.01_01</td>
<td>Opportunity for P3 to present a modest cost reduction for construction of the Pearl Highlands Garage and Transit Center.</td>
<td><img src="savings_increase.png" alt="Impact Diagram" /></td>
<td>HART has been working to make the RFP as performance-based as possible so that it allows creativity from the P3 team(s). This opportunity risk assumes a 95% Probability of a 2% to 6% capital cost savings due to P3 competitiveness compared to the base estimate.</td>
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Risk Mitigation Opportunities

1. Ensure all remaining CPP’s are appropriately budgeted.
   In coordination with Project Controls, Risk Mgt. has recently added presumed CPP’s for:
   a)  Waipahu Makai Station Entrance, P80 of $6.86 M
   b)  WOFH Median Landscaping, P80 of $2.04 M
   c)  DR Horton Utility Mitigations, P80 of $2.03 M
   d)  Above values are now included in the CPP’s

2. Resolution with West Station Contractors for Substantial Completion in time for Interim Revenue Service in Dec. 2020

3. Identify sufficient contingency in case of a gap with P3 affordability

4. Hold the line with resolution of Core Systems Claim

5. Maintain or improve upon the P3 procurement schedule

6. Cost and Schedule Reduction Opportunities with P3 for CCGS and PHGT through competitiveness, innovation and ATC’s

7. Keep CCUR on schedule to clear the path in time for P3

8. Acquire Necessary Right-of-Way in Time for CCUR and P3 for CCGS

9. Maintain Appropriate Levels of HART Staff for All Departments and Project Oversight
Contingency Drawdown Curves

Focus: Cost and Schedule Contingency Drawdown Curves, and Contract Performance Curves, with Sept. 2019 Data, for Review with HART Board POC

December 5, 2019
Contingency Management Approach

• Contingency is allocated or drawn down as soon as quantifiable impacts, risks, issues, potential change orders, or proposed change orders are identified.
• This allows for mitigation opportunities to be explored and established.
• This conservative approach to Contingency Management will show a greater fluctuation in drawdowns from month to month.
• Schedule contingency to RSD is calculated off an assumed schedule for CCGS which will be replaced once an accepted baseline is submitted.
Allocated Contingency Drawdown Curve – Sept 2019

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<tr>
<td>Milestone</td>
<td>P3 NTP</td>
<td>Interim Opening</td>
<td>DB450 Construction Complete</td>
<td>DB8511 Construction Complete</td>
<td>P3 Construction Complete</td>
<td>RSD</td>
</tr>
<tr>
<td>FTA Minimum Level (SM)</td>
<td>732</td>
<td>623</td>
<td>546</td>
<td>446</td>
<td>282</td>
<td>134</td>
</tr>
<tr>
<td>HART Minimum Level (SM)</td>
<td>598</td>
<td>489</td>
<td>412</td>
<td>312</td>
<td>171</td>
<td>85</td>
</tr>
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Schedule Contingency Drawdown Curve - Sept 2019
Contract Performance Curves

- Construction revenue performance curves are based on physical percent complete or milestone payments from the Contractor’s submitted schedules.
- All plan data is based on the contractor’s accepted baseline schedule.
- All forecast data is from the contractor’s schedule submittals and is based on 50/50 dates (midpoint of early and late dates calculated by scheduling software).
- Professional services performance curves are based on staffing plans and actual invoices.
Core Systems Performance Curve – September 2019

Early Plan 85%
Late Plan 53.9%
Actual 64.5%
CCUR Performance Curve – September 2019

Early Plan: 26.5%
Late Plan: 18.4%
Actual: 2.5%

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KHSG Performance Curve – September 2019

DBB-371 KHSG

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FHSG Performance Curve – September 2019
WOSG Performance Curve – September 2019
PMC Performance Curve – September 2019
GEC Performance Curve – September 2019
CE&I East Performance Curve – September 2019
CSOC Performance Curve – September 2019