Bay Area Toll Authority
Oversight Committee

November 13, 2019 **Agenda Item 5a.iii.**

Richmond-San Rafael Bridge Asset Management Plan Update

Subject: A progress update on the development of an asset management plan to maintain the Richmond-San Rafael Bridge (RSR) in a desired state of good repair.

Background: MAP-21 requires each state "to develop a risk-based asset management plan for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system." (23 U.S.C. 119(e)(1), MAP-21 § 1106). These asset management plans (AMPs) outline a strategy to keep transportation infrastructures in a desired state of good repair (SGR) at the minimum practicable cost. The seven state-owned toll bridges are included without distinction amongst the inventory of nearly 15,000 bridges included in the Caltrans 2017/18 Transportation AMP.

To realize the benefits of asset management on the state-owned toll bridges, BATA, in partnership with Caltrans, is developing plans specific to these bridges. The Richmond-San Rafael Bridge (RSR) was selected for the first project primarily because of the increasing cost of rehabilitation projects identified by Caltrans, which correlate to the bridge's approaching the end of its original design life. With this Committee's approval in October 2018, BATA contracted with WSP to develop the AMP.

The AMP defines the SGR and performs a:

1. Gap analysis, comparing the current condition of the bridge to that of the SGR;
2. Risk analysis, considering risks and mitigation strategies; and
3. Lifecycle cost analysis, identifying the investments necessary to maintain the bridge in the SGR over assumed lifecycle durations.

The consultant is evaluating two lifecycle alternatives: 15 and 40 years of remaining life. The 15-year scenario aligns with a conservative estimate of how long it would take to replace the bridge should a decision be made to do so. The 40-year life aligns with an approximately 100-year total useful life for the bridge. The costs of these two scenarios will be evaluated against a planning-level cost estimate for replacing the bridge to inform BATA and Caltrans' selection of a final bridge management strategy.

In addition, the consultant has been tasked with focused technical studies. These include a non-destructive evaluation of the concrete roadway deck, and a structural load rating analysis that considers the bridge's ability to

carry the weights of a third lane of vehicles and the moveable barrier on the upper deck.

The asset management work is in progress and scheduled to be complete in Spring 2020.

Concurrent with the asset management work, staff intends to conduct a bridge-corridor planning study that looks at the future of the major east-west corridors including State Route 37 and RSR. This study will help inform on the future needs of the traveling public and communities served, and identify other corridor transit, transportation, and mobility improvements. The study will identify various planning-level bridge replacement solutions and cost estimates. This work is not intended to result in a preferred alternative, but to provide further context to the assumptions used in the AMP.

Issues: None identified.

Recommendation: This item is presented for information. No action is required at this time.

Attachments: Attachment A: Richmond-San Rafael Asset Management Plan Update Presentation Slides

Therese W. McMillan

5a.iii Richmond-San Rafael Bridge (RSR): Asset Management Plan Update

November 13, 2019

Photo Credit: Tom Paiva

RSR ASSET MANAGEMENT

State of Good Repair

- **Goal:**

  A process to sustain the toll bridges in a desired state of good repair over their lifecycle at a minimum practicable cost.

- First asset management plan (AMP) is for RSR, underway
  - Final Report: March 2020

Safety

Stewardship

Sustainability

System Performance

Caltrans

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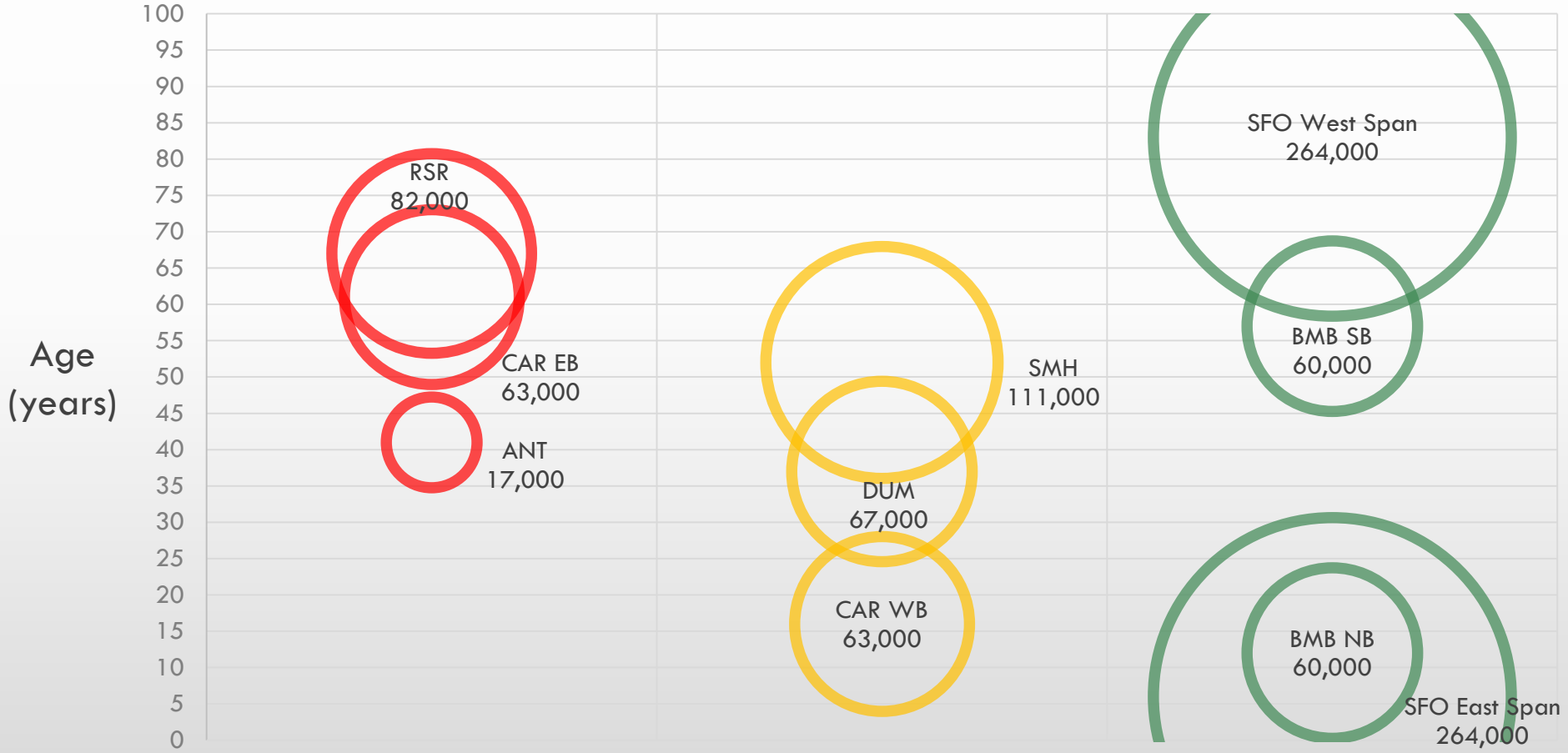
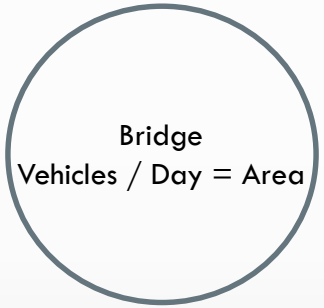
RSR ASSET MANAGEMENT

State-owned Toll Bridges: Some Vital Stats





Bridge (age(s) in years)
ANT: Antioch (41)
BMB: Benicia-Martinez (12, 57)
CAR:: Carquinez (16, 61)
DUM: Dumbarton (37)
RSR: Richmond-San Rafael (67)
SFO: San Francisco-Oakland (6, 83)
SMH: San Mateo-Hayward (52)
NB/SB/EB/WB: Northbound/etc.

Caltrans

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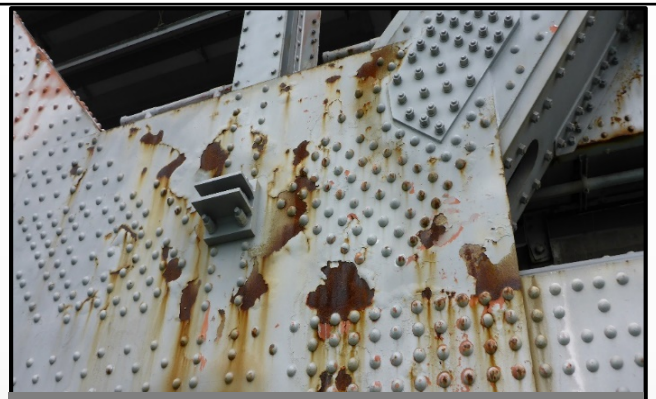
RSR ASSET MANAGEMENT

Analyses

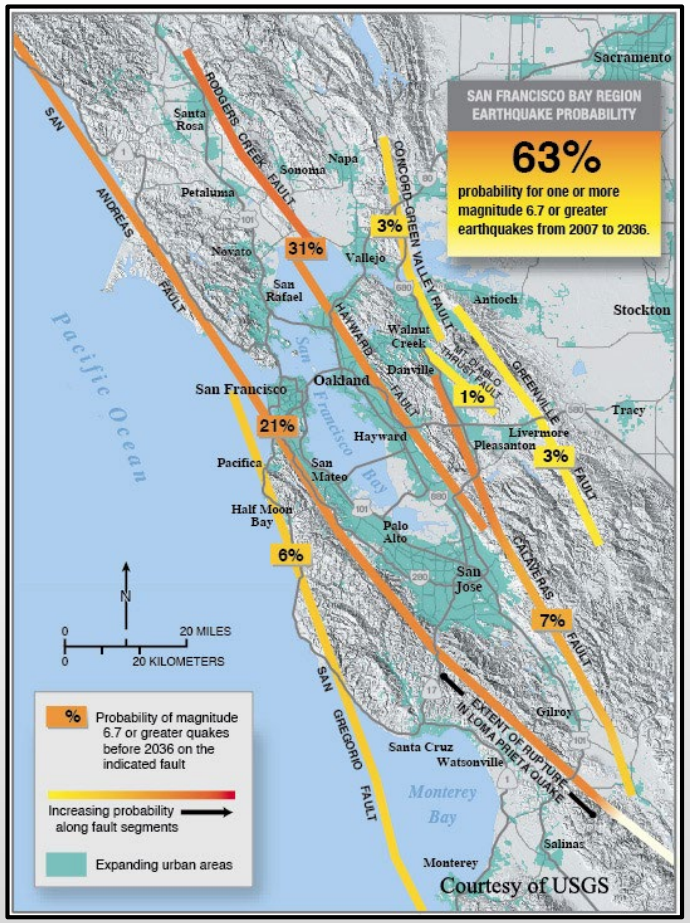
Gaps



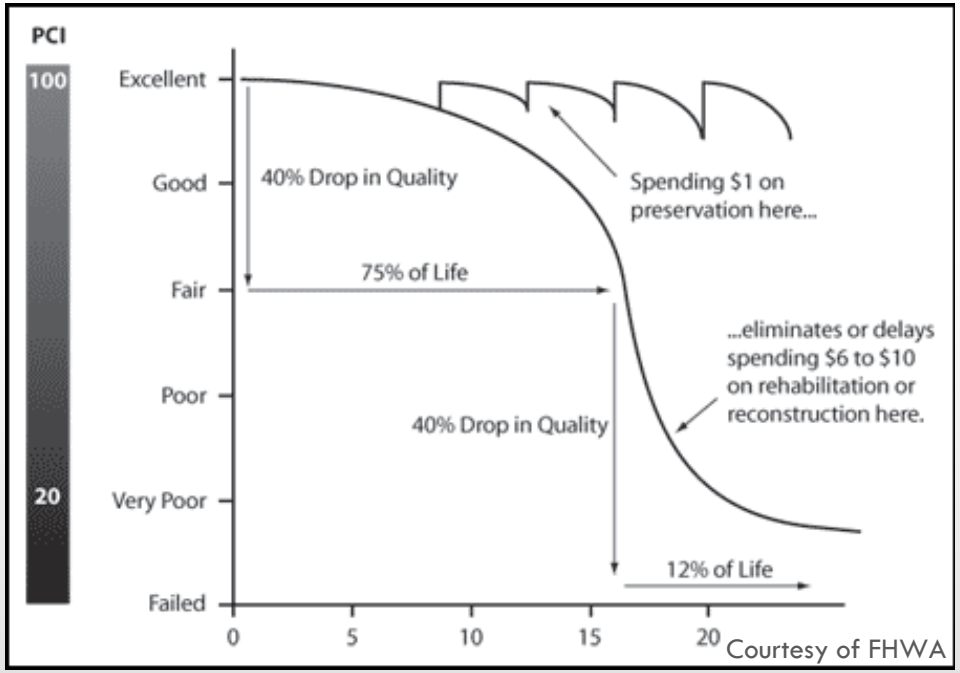
What is the condition today…

…versus the state of good repair?

Risks



Lifecycle



Caltrans

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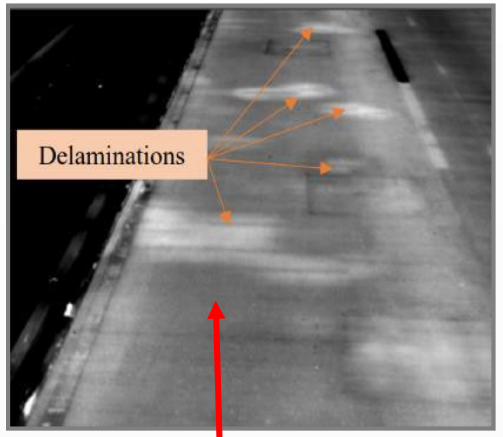
RSR ASSET MANAGEMENT

Focused Studies

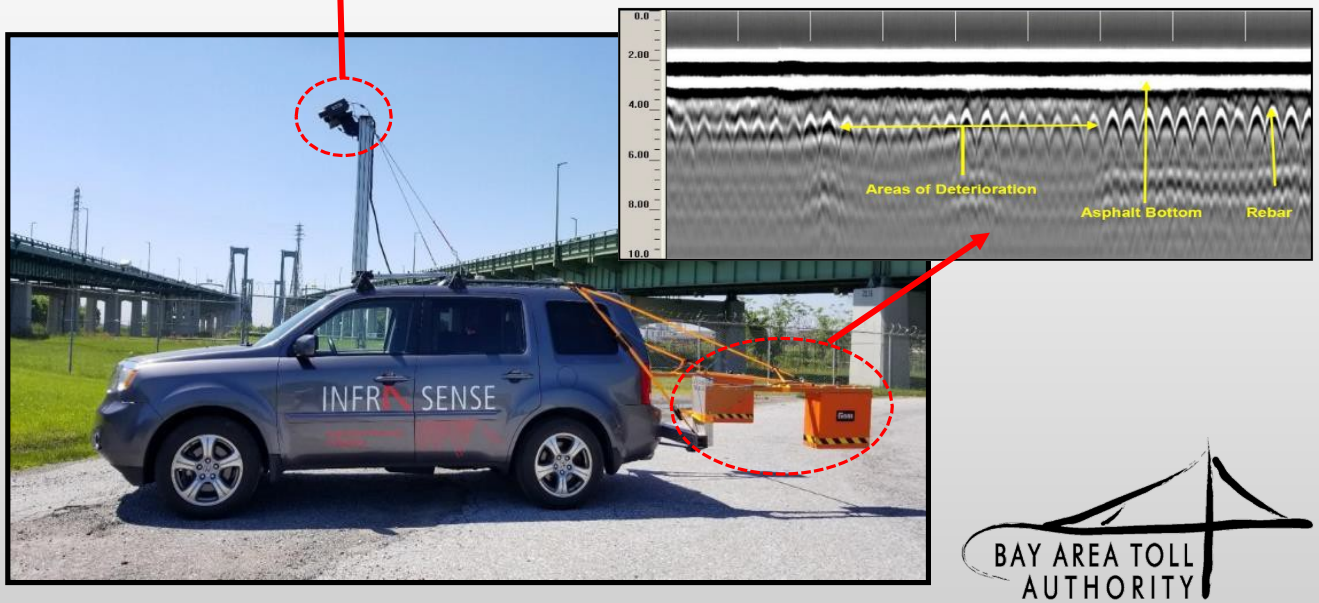
- Deck Testing (Non-Destructive)
  - Non-destructive tests completed
  - Concrete cores tested
  - Joints replacement mitigated highest risk

- Final report: November 2019



Tests:
1. Infrared thermography
2. Ground penetrating radar
3. High-resolution video
4. Digital acoustic response

Conditions to find:
1. Rebar corrosion
2. Delamination
3. Spalls
4. Cracks



Caltrans

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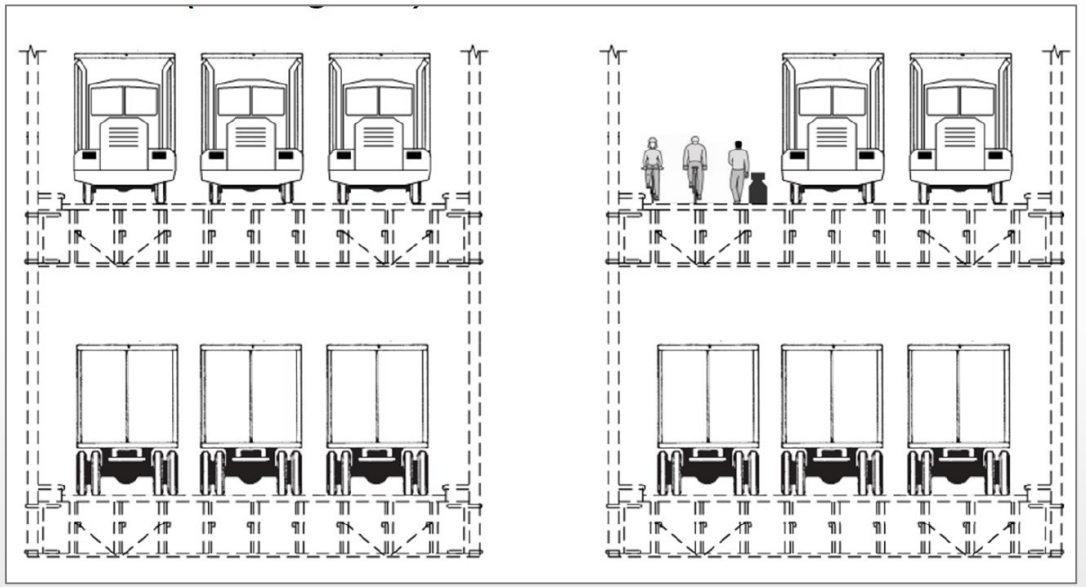
RSR ASSET MANAGEMENT

Focused Studies

- Structural Load Analysis
  - Three lanes with a moveable barrier on the upper deck.
  - Final Results: Spring 2020



RSR ASSET MANAGEMENT

Next Steps

- Determine strategy by building from Asset Management Plan and Focused Studies:
  - Near-term projects list.
  - Rehab plan, optimized for cost and performance over bridge lifecycle.
  - Bridge replacement cost/schedule estimate.
- Key questions
  - Will certain RSR rehab projects be necessary to meet near-term needs?
  - Do such investments potentially extend the useful life of the existing bridge?
  - How might cost and timing of a replacement bridge affect other RSR corridor needs?
- Evaluation: Late 2020

Photo Credit: Tom Paiva