EARTHQUAKE READY BURNSIDE BRIDGE

Senior Agency Staff Group Meeting

Department of Community Services
Transportation Division

July 14, 2017

Agenda

1. Introductions
2. Project Update
3. Screening Process
4. Screening Results
5. Schedule Review
6. Closing Remarks

2. Project Update

Key Activities

2. Project Update

Stakeholder Outreach – Key Activities

- Committee Meetings
  - SRG #1 – April 17, 2017
- Briefings
  - Kerns Neighborhood Assoc., March 15, 2017
  - MultCo Bike Ped Committee, April 12, 2017
  - Buckman Neighborhood Assoc., April 13, 2017
  - Port of Portland, July 6, 2017
  - USACE, July 11, 2017
- Equity & Diversity Outreach
  - Briefings vs. workshops
  - Bridgetown Night Strike, July 11, 2017
  - VOZ, July 21, 2017

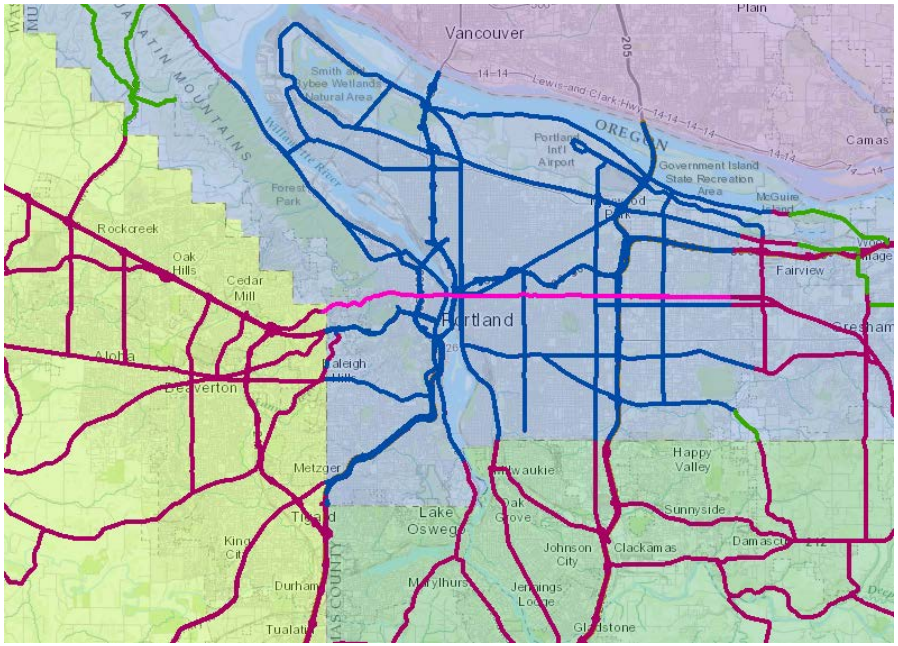
2. Project Update

Technical Community – Key Activities

- Emergency Management Roundtable, June 14th, 2017
- Seismic Resiliency Committee Meeting, June 20th, 2017
  - Seismic Design Criteria
  - Technical Design Guidance

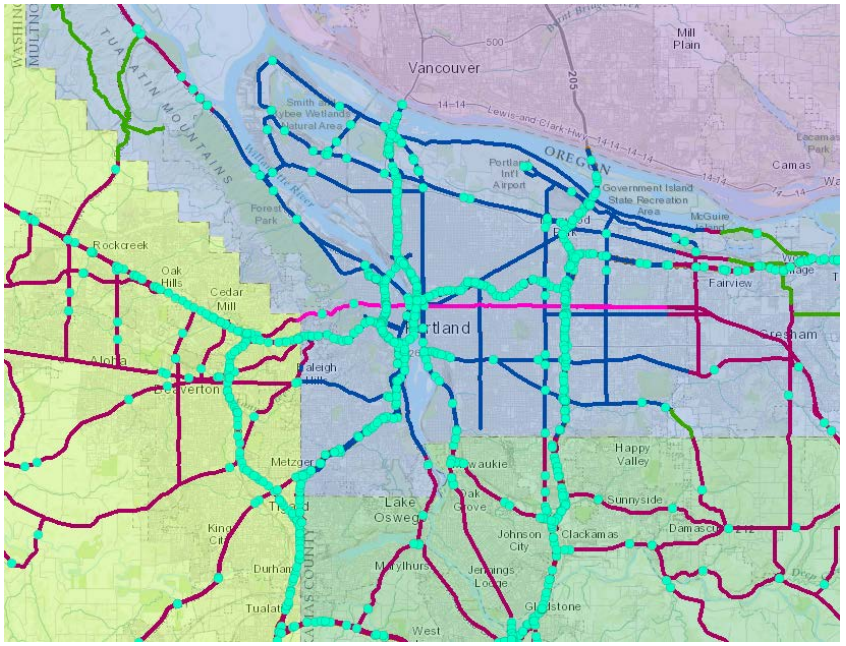
2. Project Update

Technical Community – Emergency Management Round Table



All Regional Emergency Transportation Routes (ETRs)

Last updated 2005



All bridges located on or over Regional ETRs

Key Finding #1

- Assumptions have been made about the availability of transportation routes after a major earthquake

2. Project Update

Technical Community – Emergency Management Round Table

TRIMET

Metro

CLACKAMAS COUNTY

READINESS. RESPONSE. RECOVERY.
PBEM
PORTLAND BUREAU OF EMERGENCY MANAGEMENT

STATE OF OREGON 1859

Multnomah County
Emergency Management

Key Finding #2

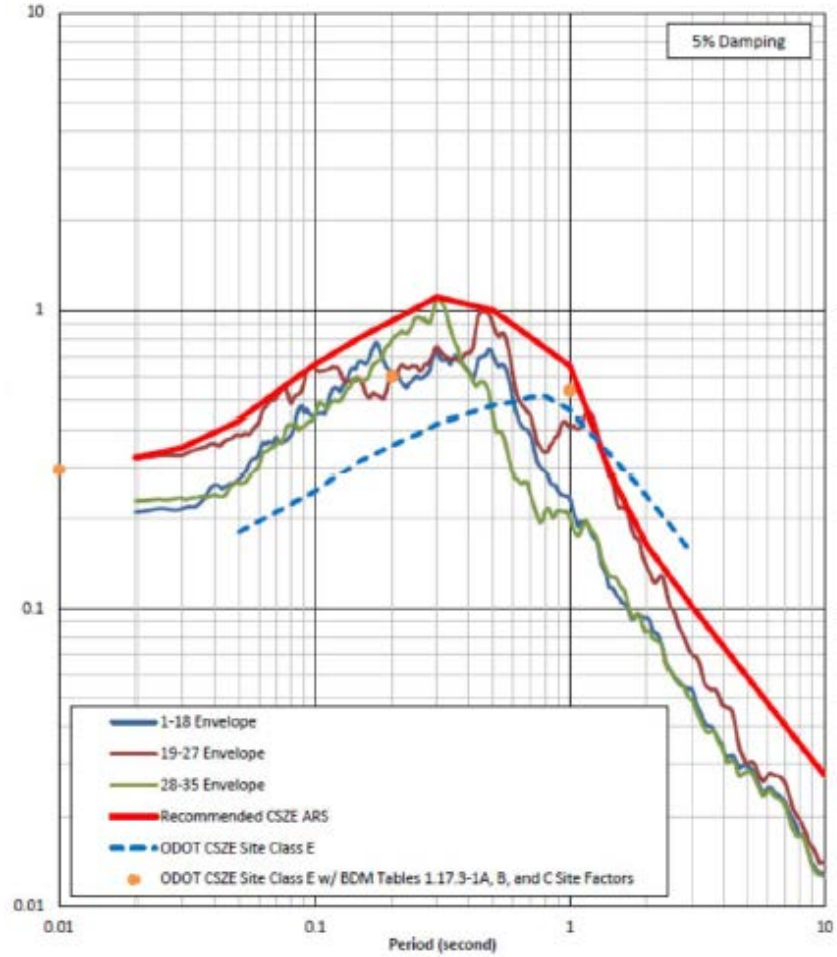
- Agencies working towards the same goal
  - Transportation Recovery Plan (PBEM)
  - Debris Management Plan (Metro)
  - URM Seismic Retrofit Project (PBEM)

Key Finding #3

- Many opportunities to coordinate moving forward.

2. Project Update

Technical Community – Seismic Resiliency Committee



Custom Burnside Response Spectrum
Cascadia Subduction Zone Earthquake

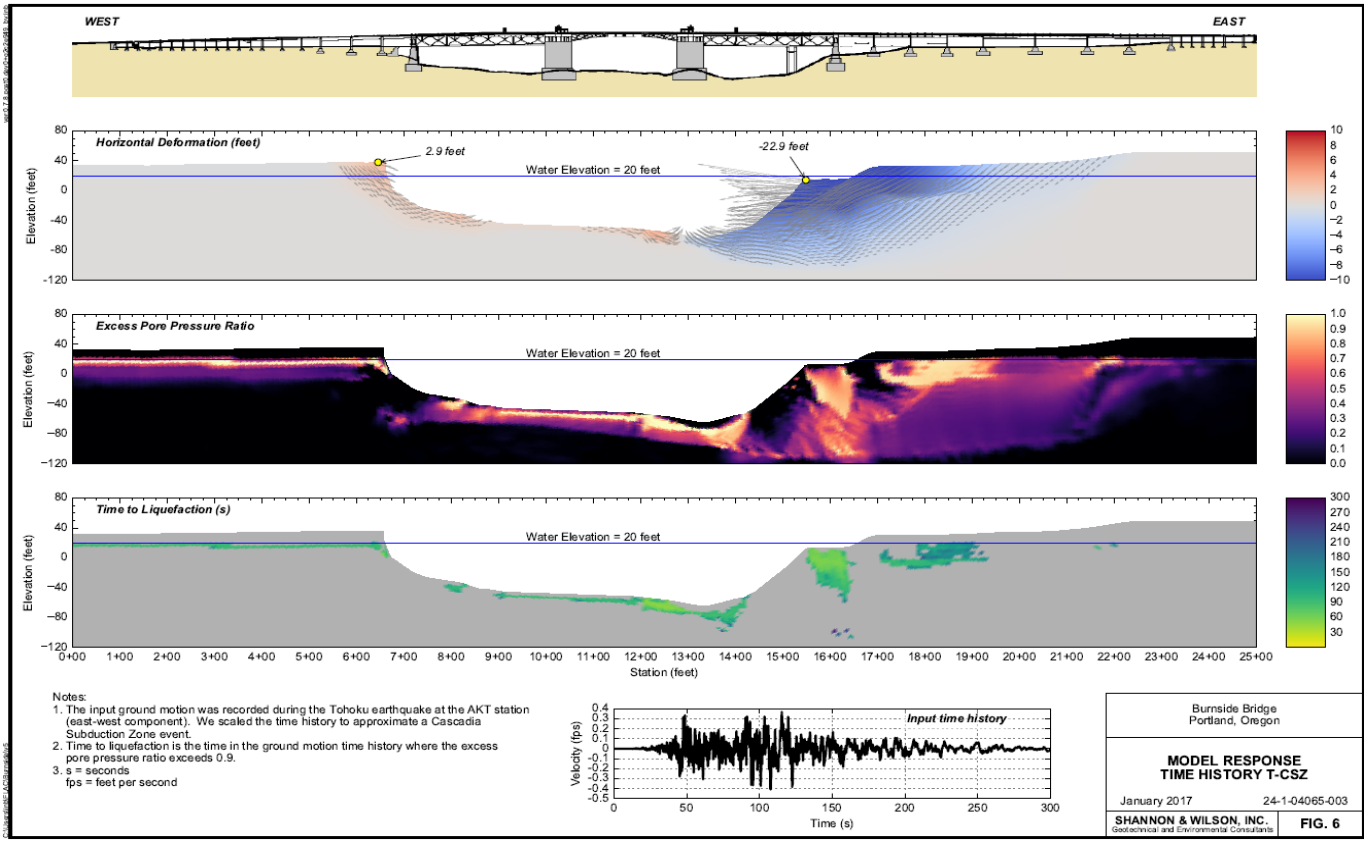
Key Performance Criteria

➢ **Examples:**

- What does the earthquake look like?
- What heavy haul or specialty vehicles will need to use the bridge?
- When will the bridge be operable following an earthquake?
- What assumptions are being made about crossing design features (height, width, elevation, etc.) ?

2. Project Update

Technical Community – Seismic Resiliency Committee

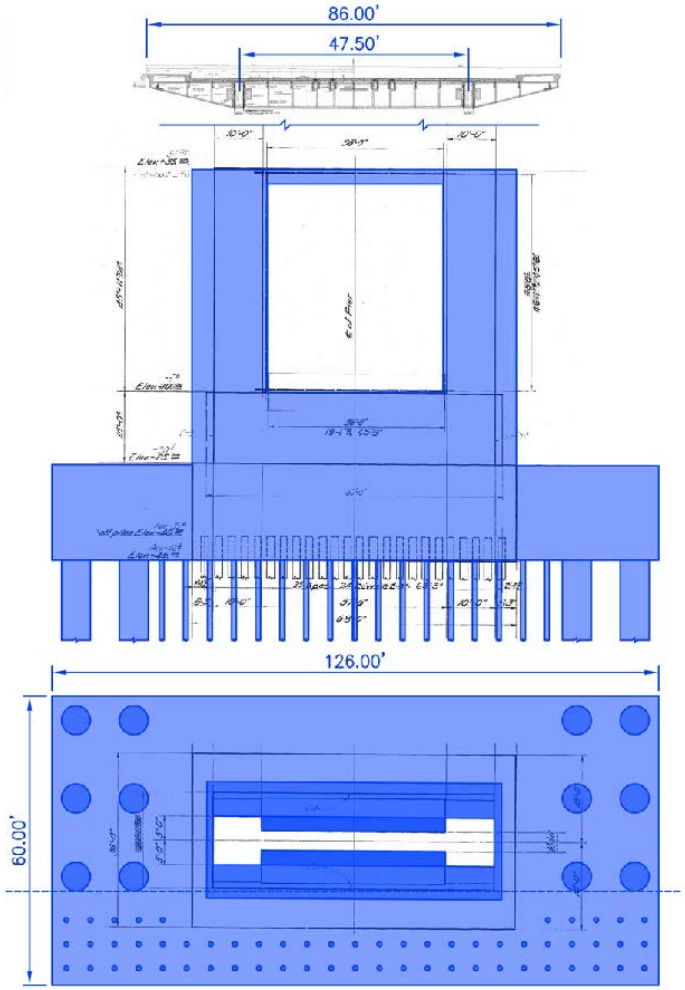


➢ Key Findings #1

- What does the soil look like?
- How bad is the liquefaction?
- How much would it cost to fix it?

2. Project Update

Technical Community – Seismic Resiliency Committee



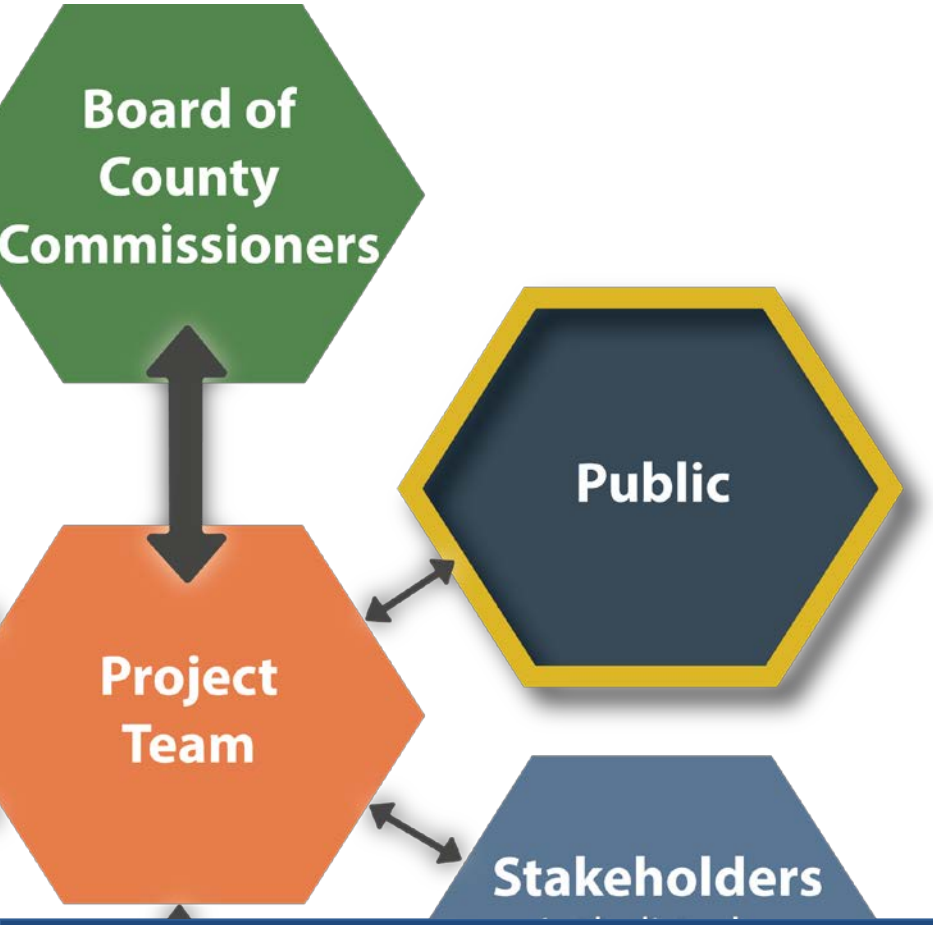
- **Key Finding #2 – A Different Look**
  - Enlarged members
    - Widened and thickened piers
    - Enlarged footings
    - Additional deep foundation members

2. Project Update

Key Activities

2. Project Update

Key Activities – Public Outreach



- **Outreach**
  - Website, social media
  - Videos
  - Survey

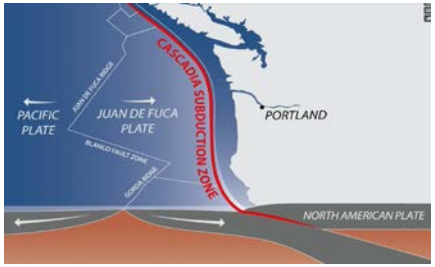
2. Project Update

Key Activities – Public Outreach

Website/Videos

Project Overview -Teaser

Lifeline



Earthquake

Emergency Response

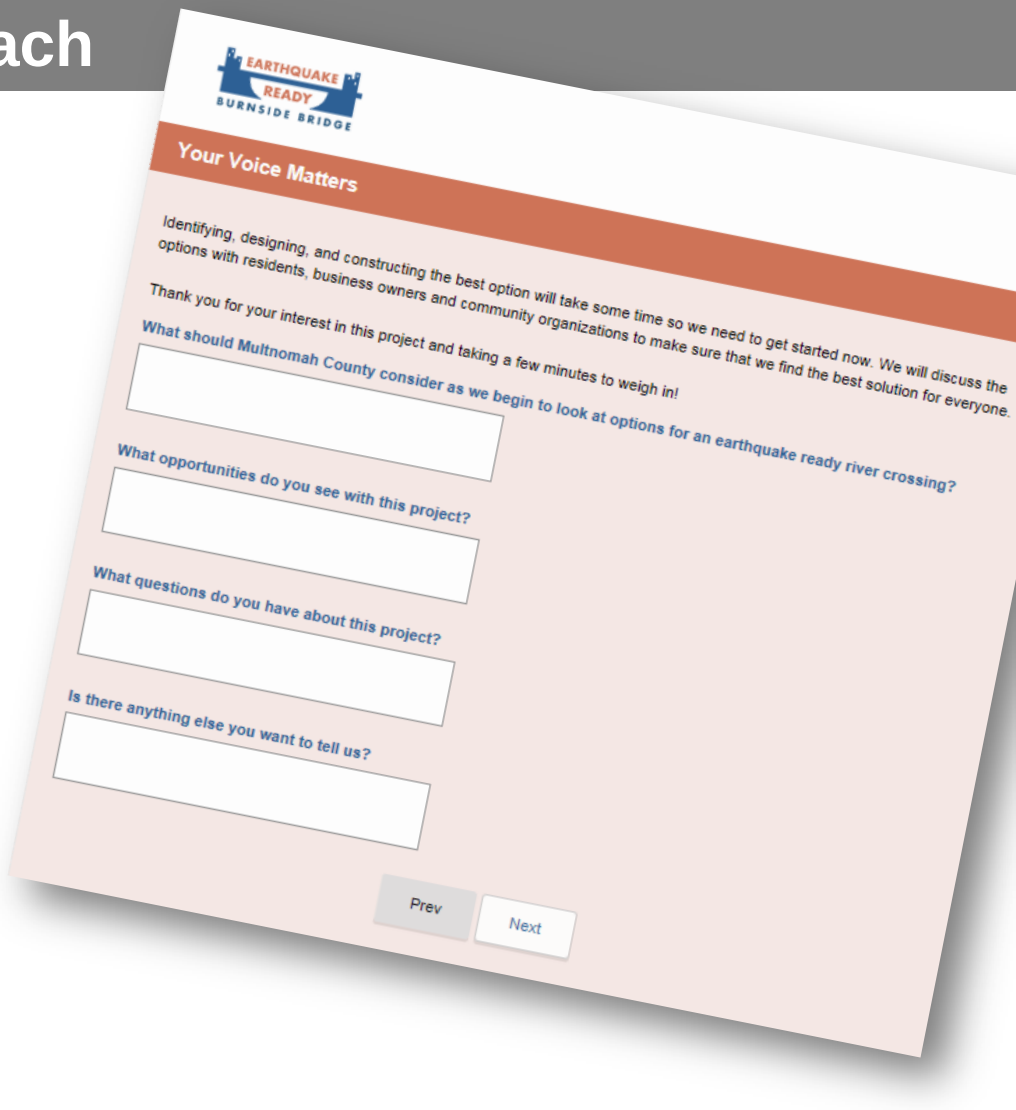
Simulation

2. Project Update

Key Activities – Public Outreach

Survey

- What should Multnomah County consider as we begin to look at options for an earthquake ready river crossing?
- What opportunities do you see with this project?
- What questions do you have about this project?
- Is there anything else you want to tell us?



2. Project Update

Key Activities – Public Outreach

Survey

2. Project Update

Key Activities – Public Outreach

Survey

2. Project Update

Discussion Break

3. Screening Results

Screening Process

3. Screening Results

Screening Process – Pass/Fail Criteria

3. Screening Results

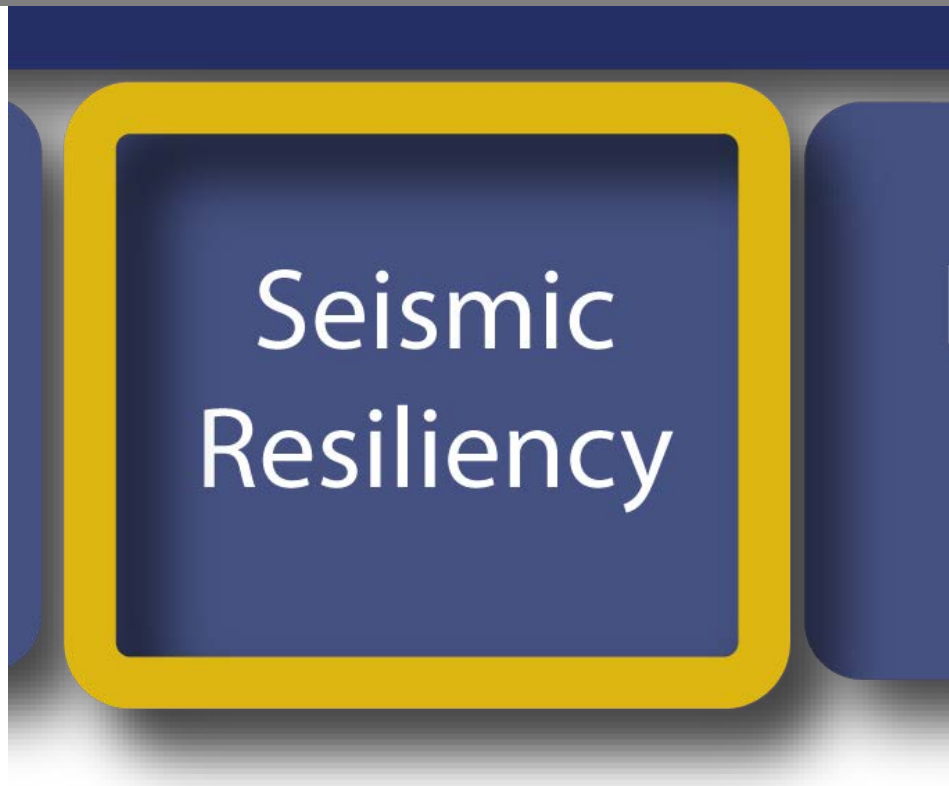
Pass/Fail Criteria – Major Infrastructure Compatibility

FAIL =

Causes prolonged, substantial interruption or degradation of the use or function of other major infrastructure

3. Screening Results

Pass/Fail Criteria – Seismic Resiliency



FAIL =

The crossing option does not fully comply with the Seismic Design Criteria

3. Screening Results

Pass/Fail Criteria – Emergency Response

FAIL (any of the following) =

- The route from the lifeline to the crossing:
  - Has two or more blockage locations, including seismically vulnerable bridges
  - Is more than 2 miles of out of direction travel
- The crossing option has two or fewer travel lanes usable by emergency vehicles

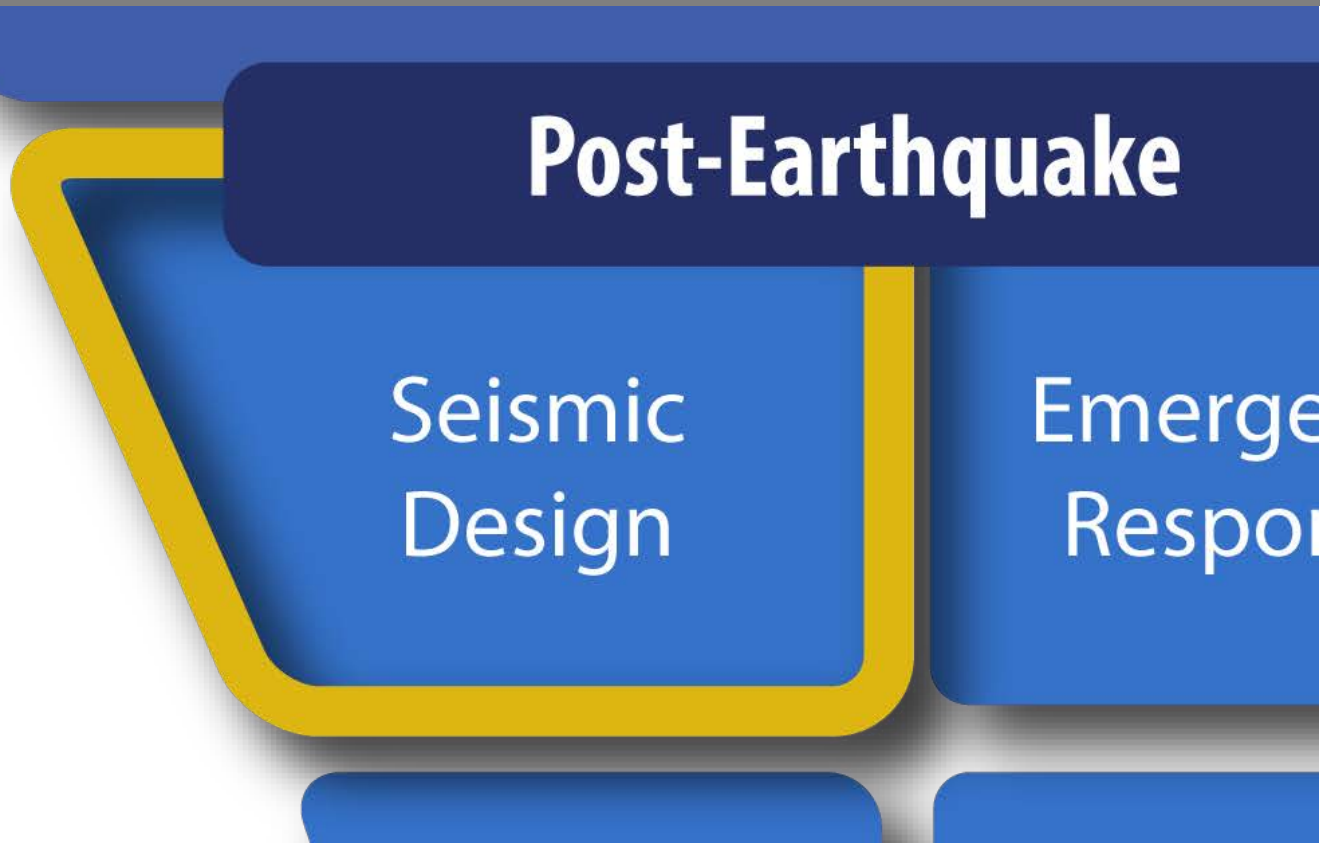
3. Screening Results

Screening Process – Scoring Criteria

Rating
1 = Poor
3 = Fair
5 = Good

3. Screening Results

Scoring Criteria – Seismic Design



Rating
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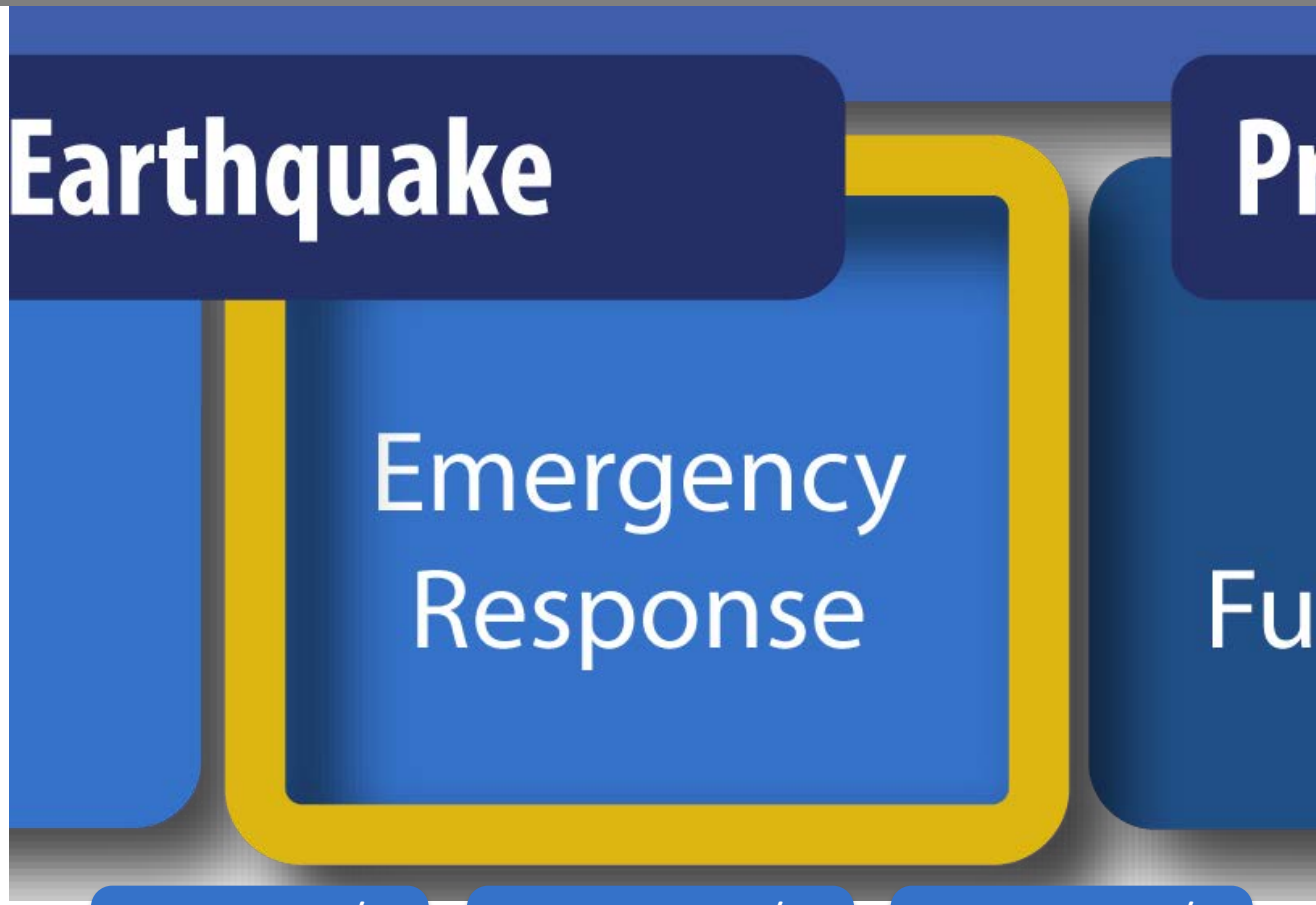
3. Screening Results

Scoring Criteria – Emergency Response



Rating
1 = Poor
3 = Fair
5 = Good

3. Screening Results

Scoring Criteria – Emergency Function

Rating

1 = Poor
3 = Fair
5 = Good

Emergency Function

- A. ADA
- B. Bike / Ped
- C. Motor Vehicle
- D. River Users

3. Screening Results

Scoring Criteria – Emergency Plan Consistency

Rating
1 = Poor
3 = Fair
5 = Good

3. Screening Results

Scoring Criteria – Everyday Function

Rating
1 = Poor
3 = Fair
5 = Good

3. Screening Results

Scoring Criteria – Ease of Maintenance

Rating
1 = Poor
3 = Fair
5 = Good

3. Screening Results

Sample Calculation

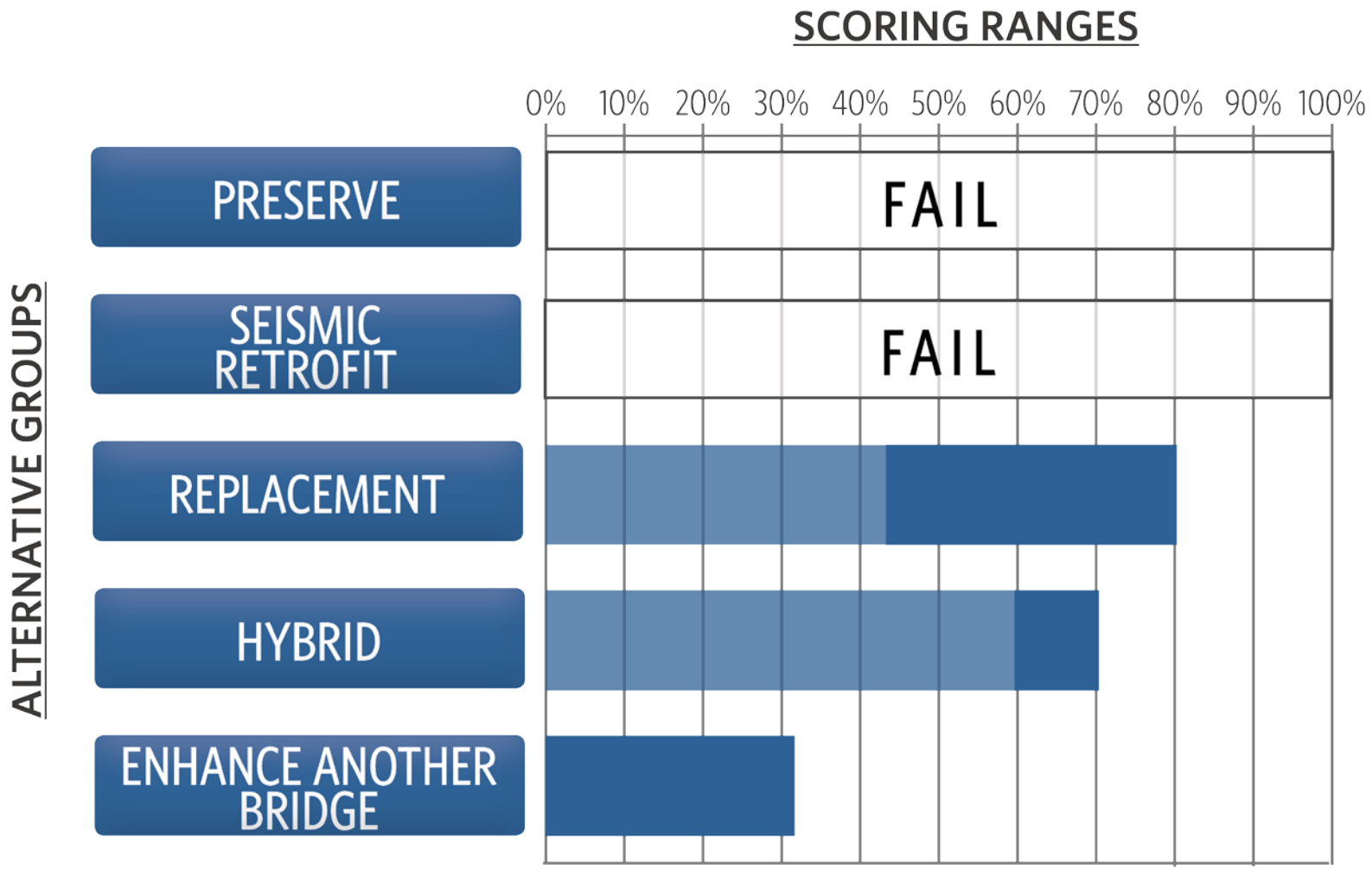
	Screening - Rating Factors											Ratings	
	Seismic	Emergency Service			Emergency Function				Emrg. Plan	Pre-EQ Function			
Alternative	1 Seismic	2a Access	2b Distance	2c Capacity/ Congestion	3a ADA	3b Bike / Ped	3c Motor Vehicle	3d River Users	4 Plan Consistency	5a Preventative Maintenance	5b Routine Functionality	Wtd	Wtd Normalized
In-kind, Low Movable Replacement	3	5	5	5	5	5	3	3	5	3	5		
weighted scores	*60.0*	*33.3*	*33.3*	*33.3*	*25.0*	*25.0*	*15.0*	*15.0*	*100.0*	*30.0*	*50.0*	*420.0*	***80%***

Calculation Sheet Description

1. Alternative ID
2. Screening Numerical Criteria Ratings
   - 1 = Poor
   - 3 = Fair
   - 5 = Good
3. Criteria Equally Weighted
4. Ratings Distributed by % of Total Available Score

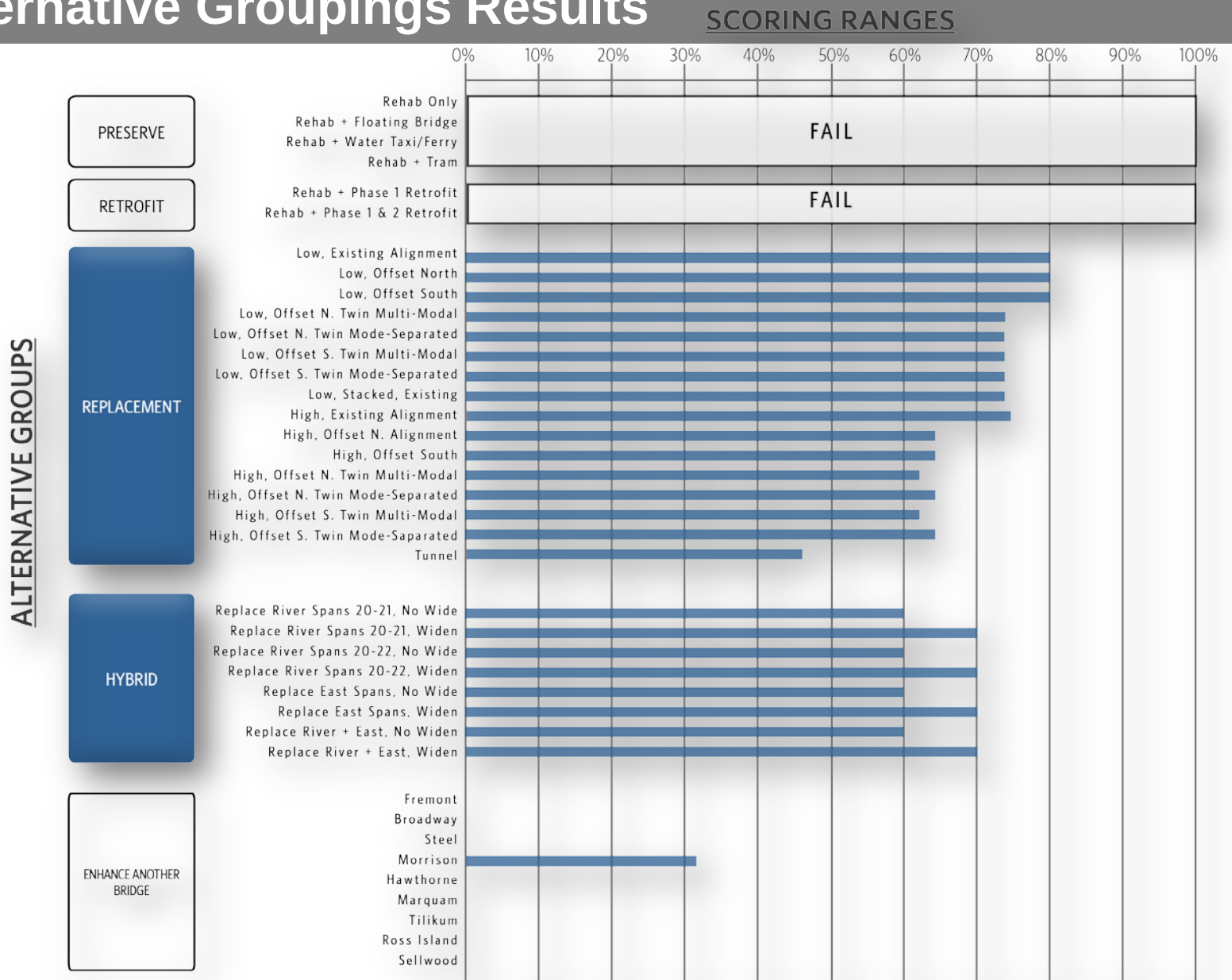
3. Screening Results

Alternative Groupings



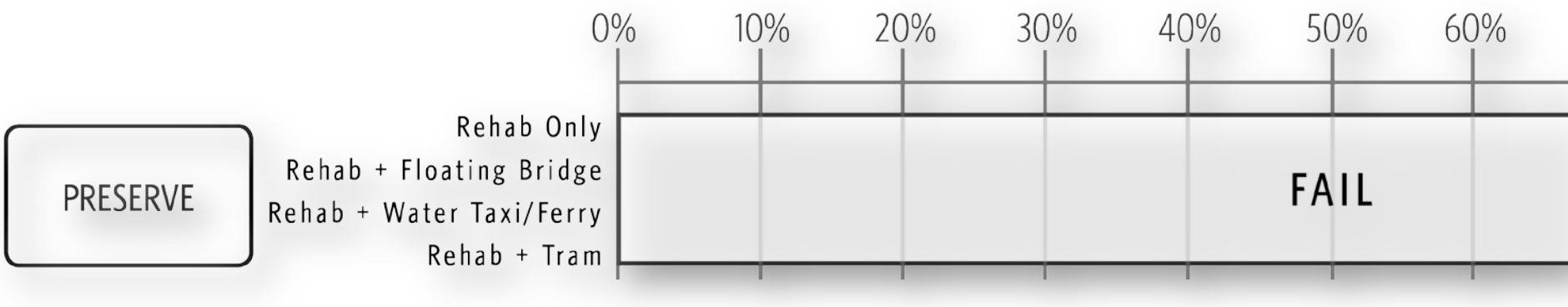
3. Screening Results

Alternative Groupings Results



3. Screening Results

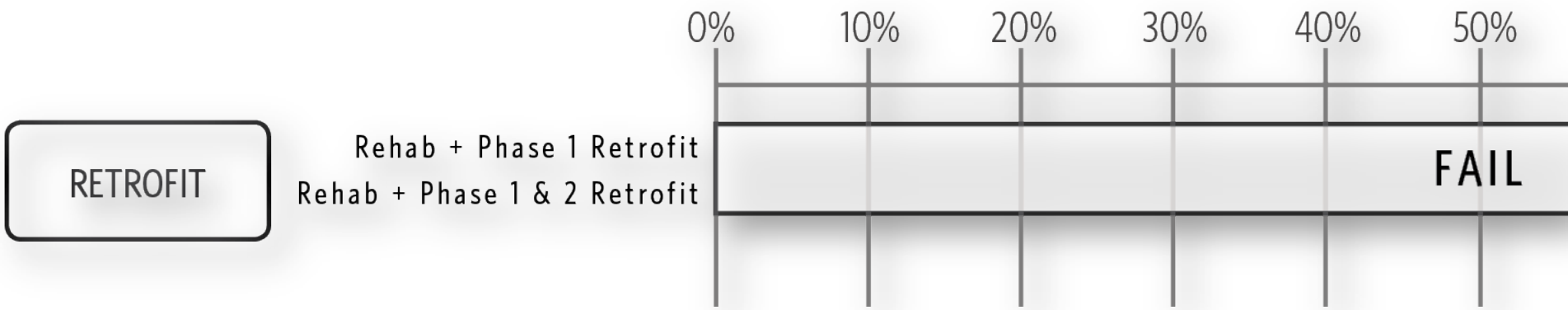
Alternative Grouping – Preserve



- All 'Preserve' alternatives failed the Pass/Fail criteria
  - **Preservation (No Build):** Did not meet seismic standards
  - **Preservation (+ Misc.):** Did not satisfy immediate Emergency Service requirements

3. Screening Results

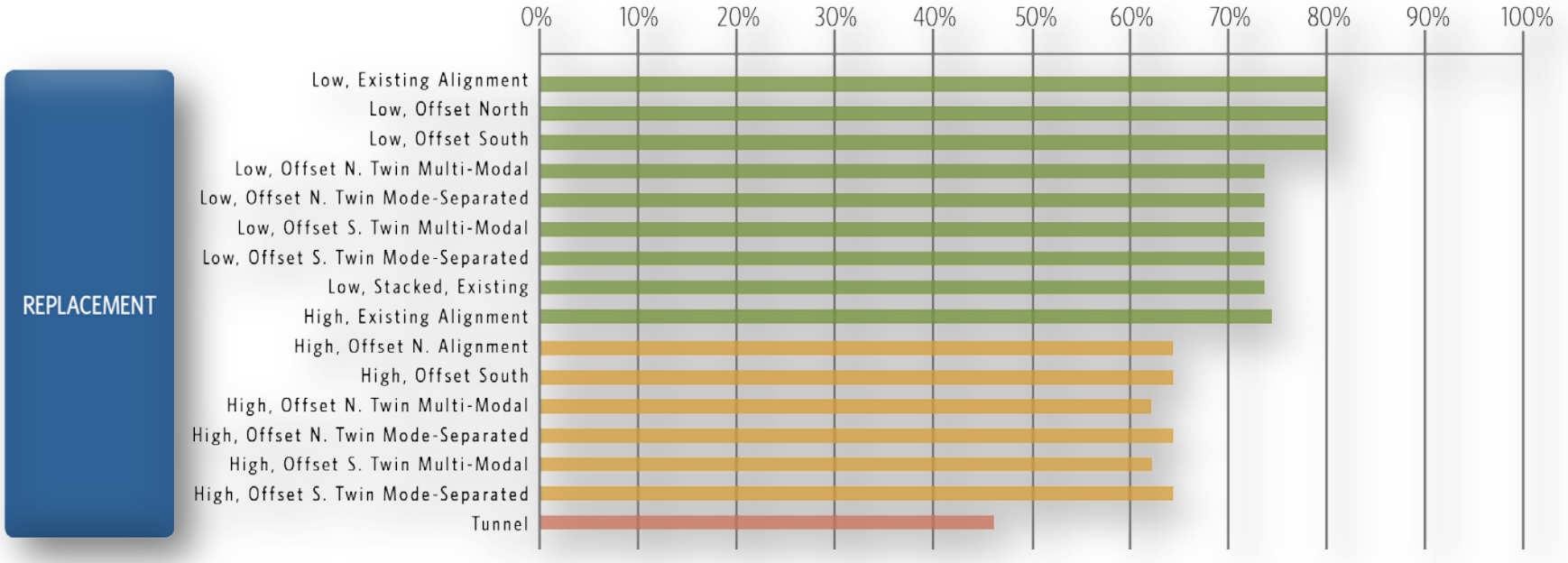
Alternative Grouping – Seismic Retrofit



- All 'Retrofit' alternatives failed the Pass/Fail criteria
  - **Pure Seismic Retrofit:** Could not be constructed to avoid long-term disruptions to I-5

3. Screening Results

Alternative Grouping – Replacement

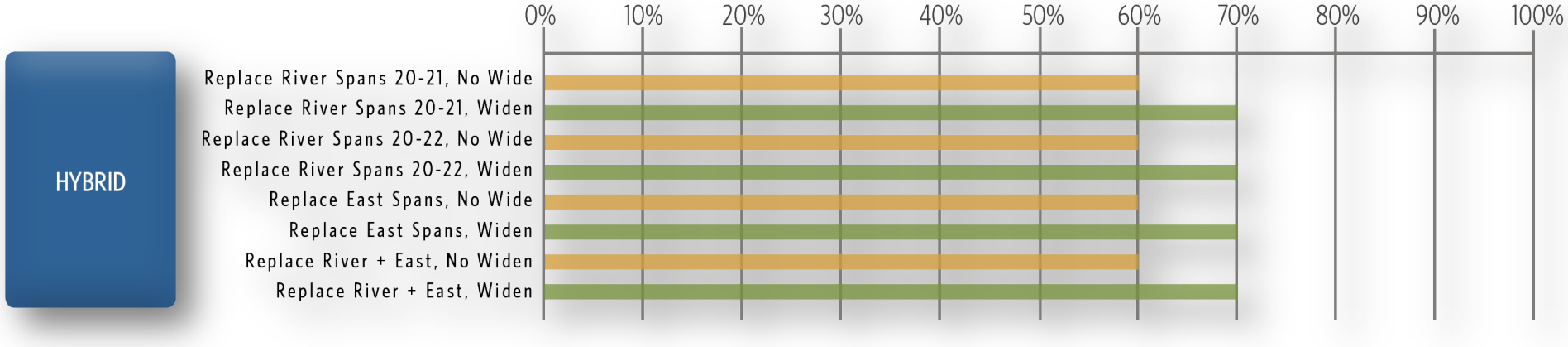


➢All 'Replacement' alternatives pass

- **Low-elevation Movable:** Scored high for most criteria
- **High-elevation Fixed:** Scored in middle due to more bike / pedestrian impacts vs low-elevation
- **Tunnel:** Scored lowest due to impacts to bike / pedestrian, challenges for connectivity, and less ideal post-EQ recovery accessibility vs other alternatives

3. Screening Results

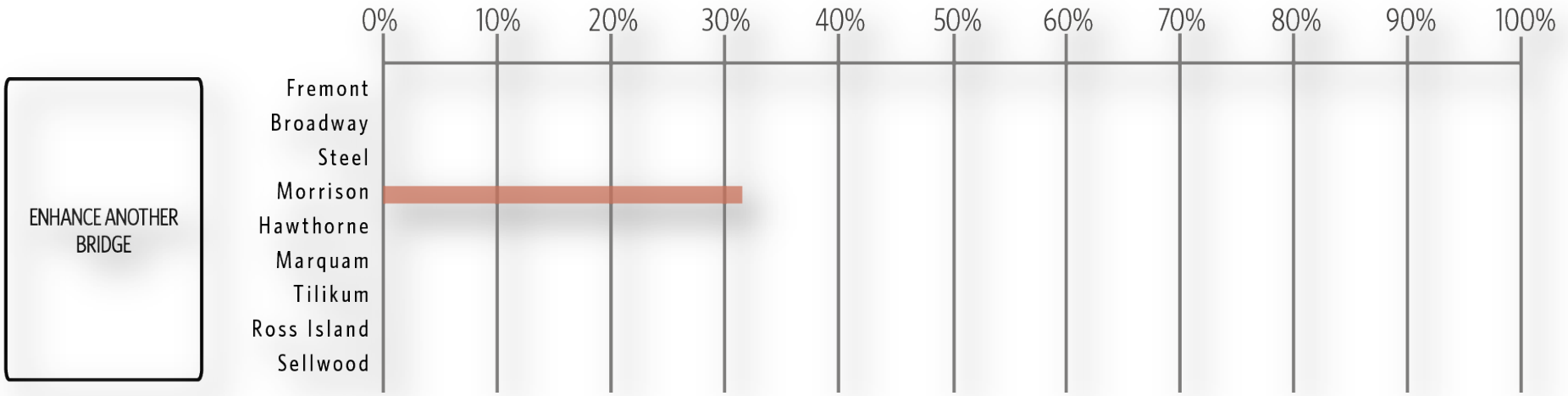
Alternative Grouping – Hybrid



- All 'Hybrid' alternatives pass despite reliance on aging materials
  - **Hybrid:** Reliance on many existing structural elements reduced the seismic score compared to replacement alternatives

3. Screening Results

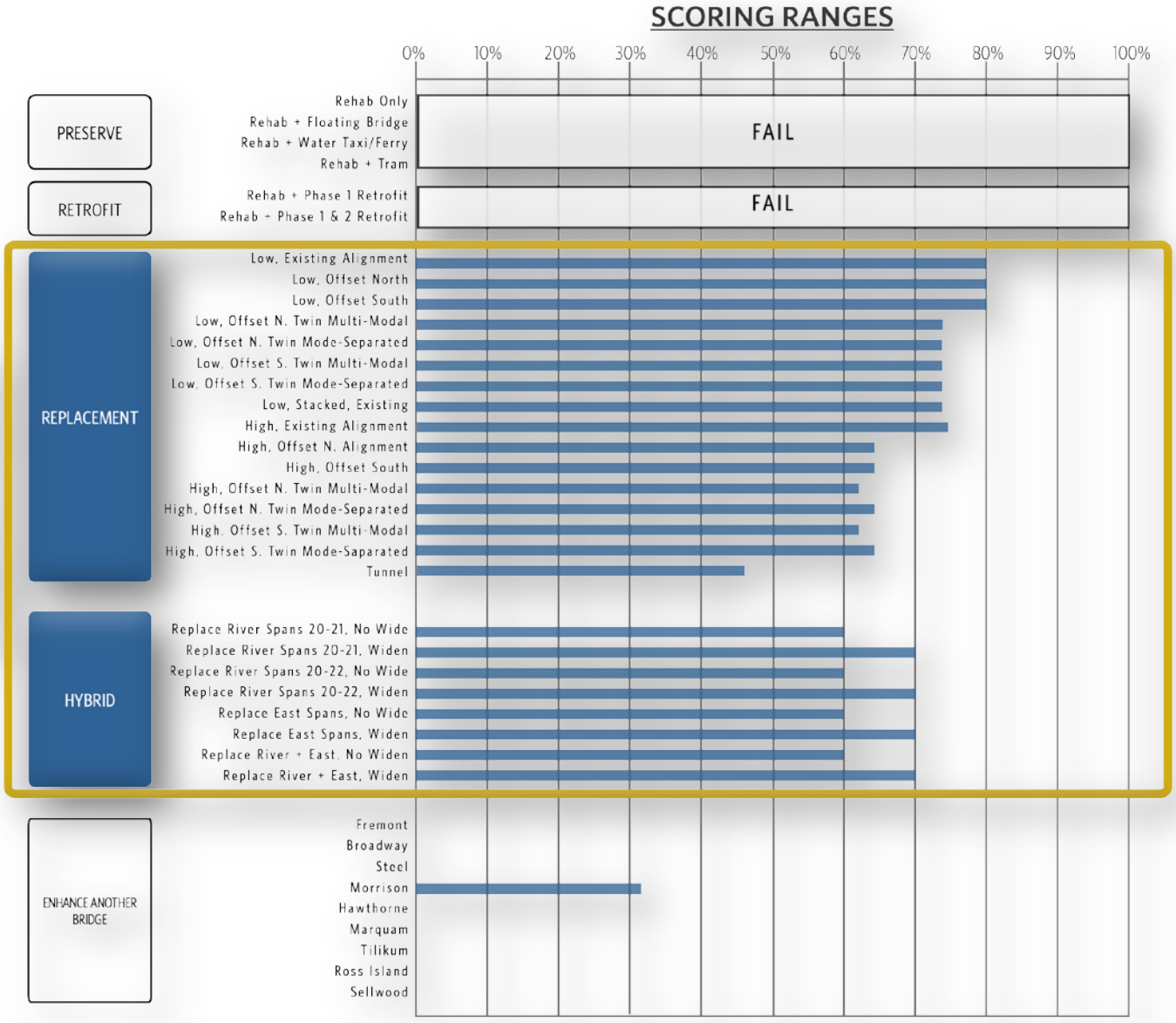
Alternative Grouping – Enhance Another Bridge



- All alternatives except Morrison Bridge failed the Pass/Fail criteria
  - **All except Morrison:** Long detour routes, multiple obstructions, and/or narrow bridges resulted in FAIL
  - **Morrison Bridge:** Has the lowest score of all rated alternatives

3. Screening Results

Key Findings and Recommendations

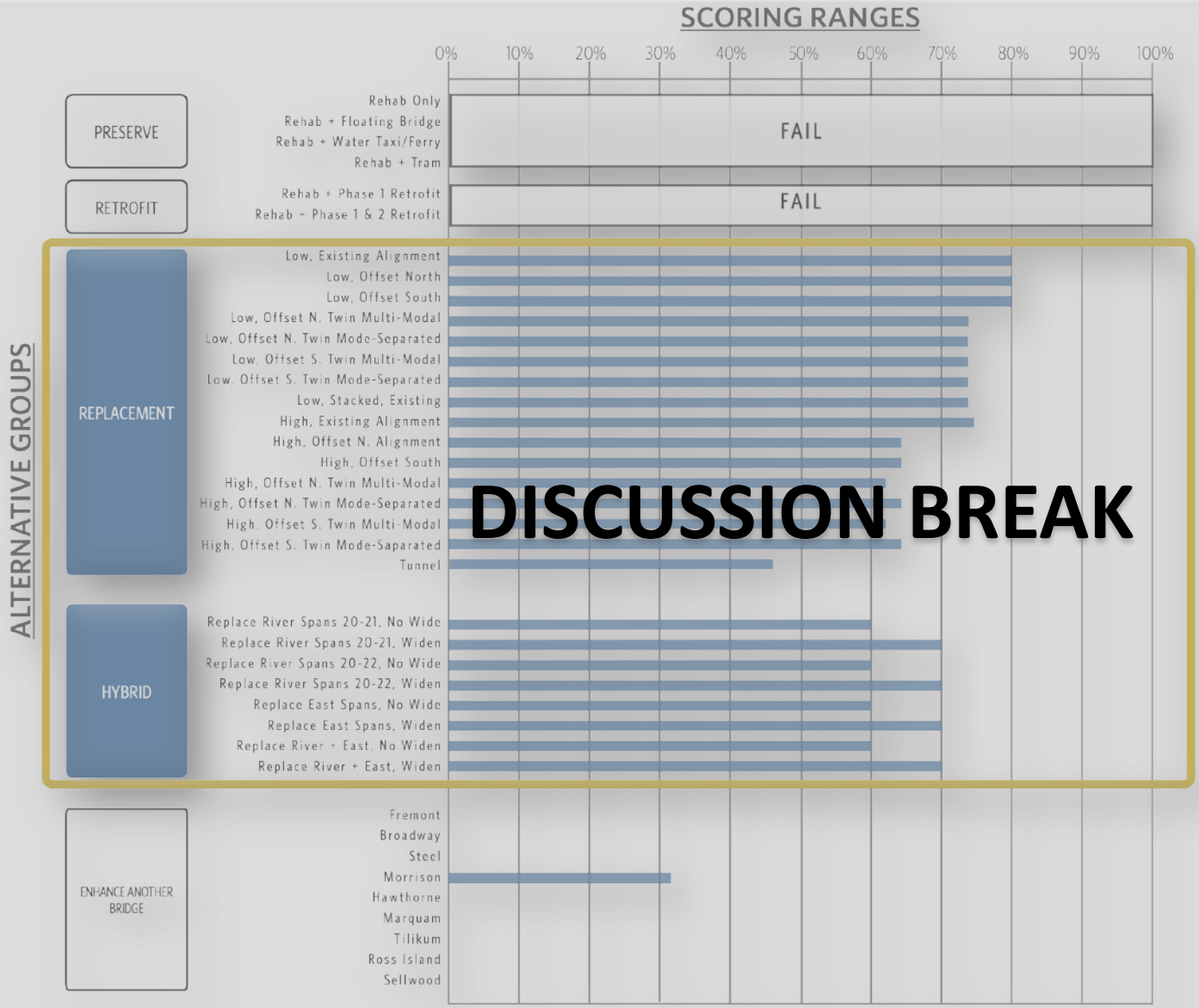


Results:

Of the 5 groups of alternative types, 3 groups were eliminated through the screening process

3. Screening Results

Key Findings and Recommendations



DISCUSSION BREAK

Results:

Of the 5 groups of alternative types, 3 groups were eliminated through the screening process

4. Alternatives Evaluation

4. Alternatives Evaluation

Guiding Principles

- Measurable at the level of design and information that will be available in this step
- Help differentiate alternatives
- Reflect input received to-date
- Narrow range of crossing options to be carried forward into an environmental impact statement.

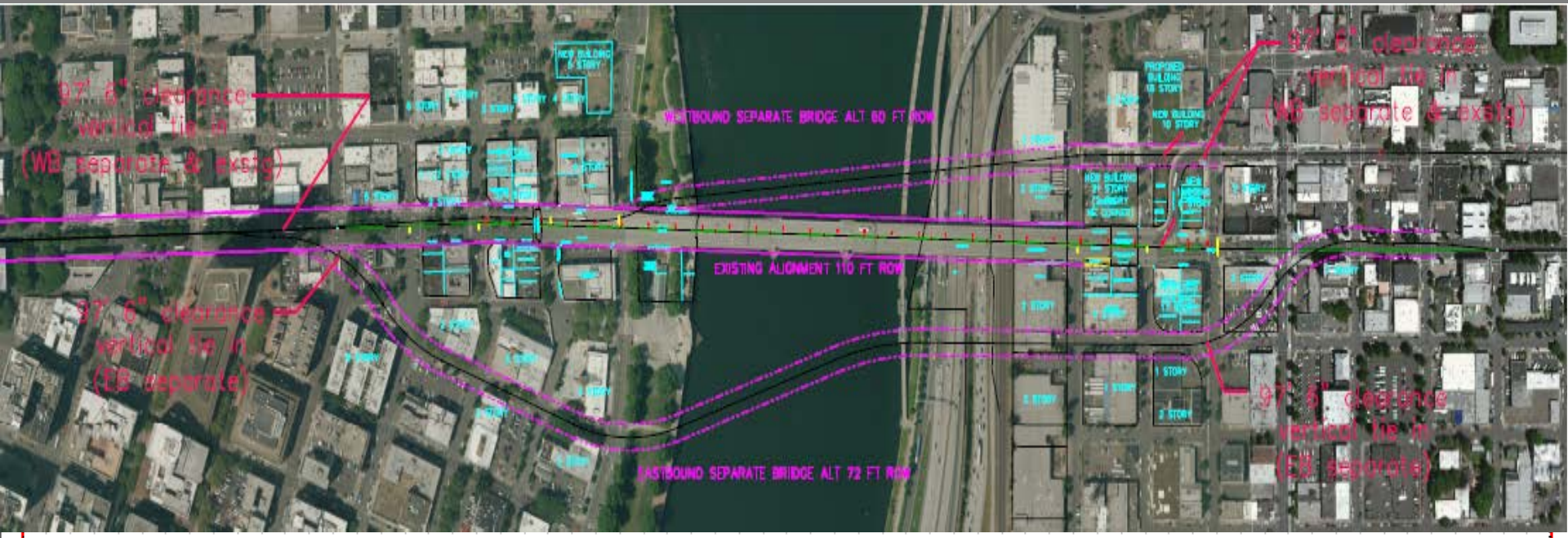
4. Alternatives Evaluation

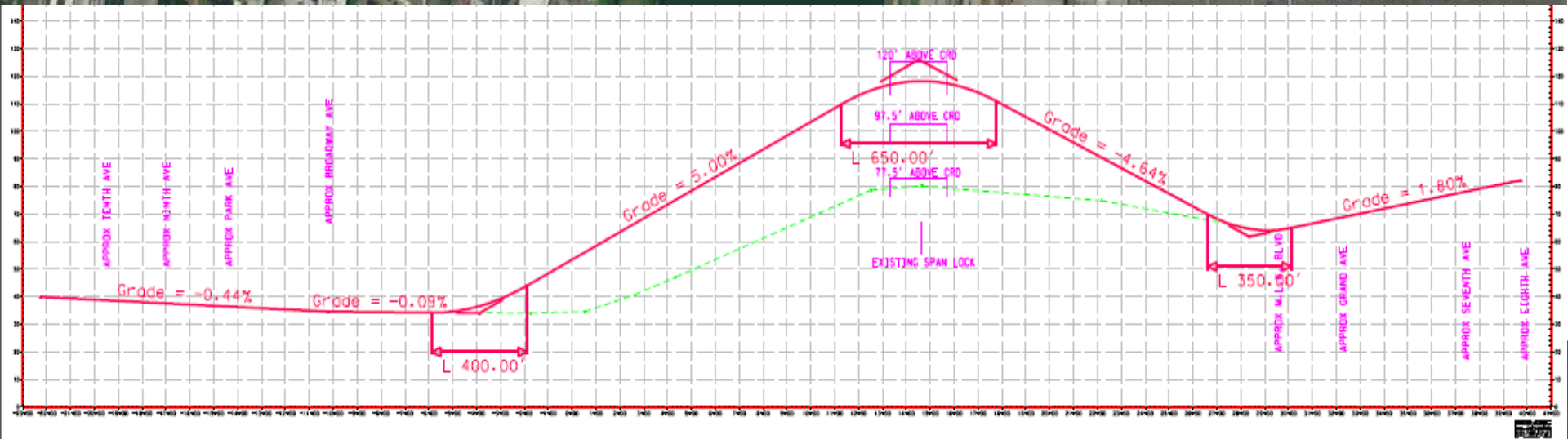
EVALUATION

- **Equity and Diversity**
- **Bike/Ped/ADA Access**
- **Social Resources** (neighborhoods, social services, etc.)
- **Recreation**
- **Land Use and Economic Development**
- **Historic/Cultural**
- **Natural Environment**
- **Right of Way**
- **Facility Use** (HazMat, emergency equipment, vessels, heavy haul, etc)
- **Construction**
- **Seismic Performance**
- **Transit Access and Connectivity**
- **Traffic Congestion**
- **Sustainability**
- **Cost**
- **Permitting Requirements**
- **Others?**

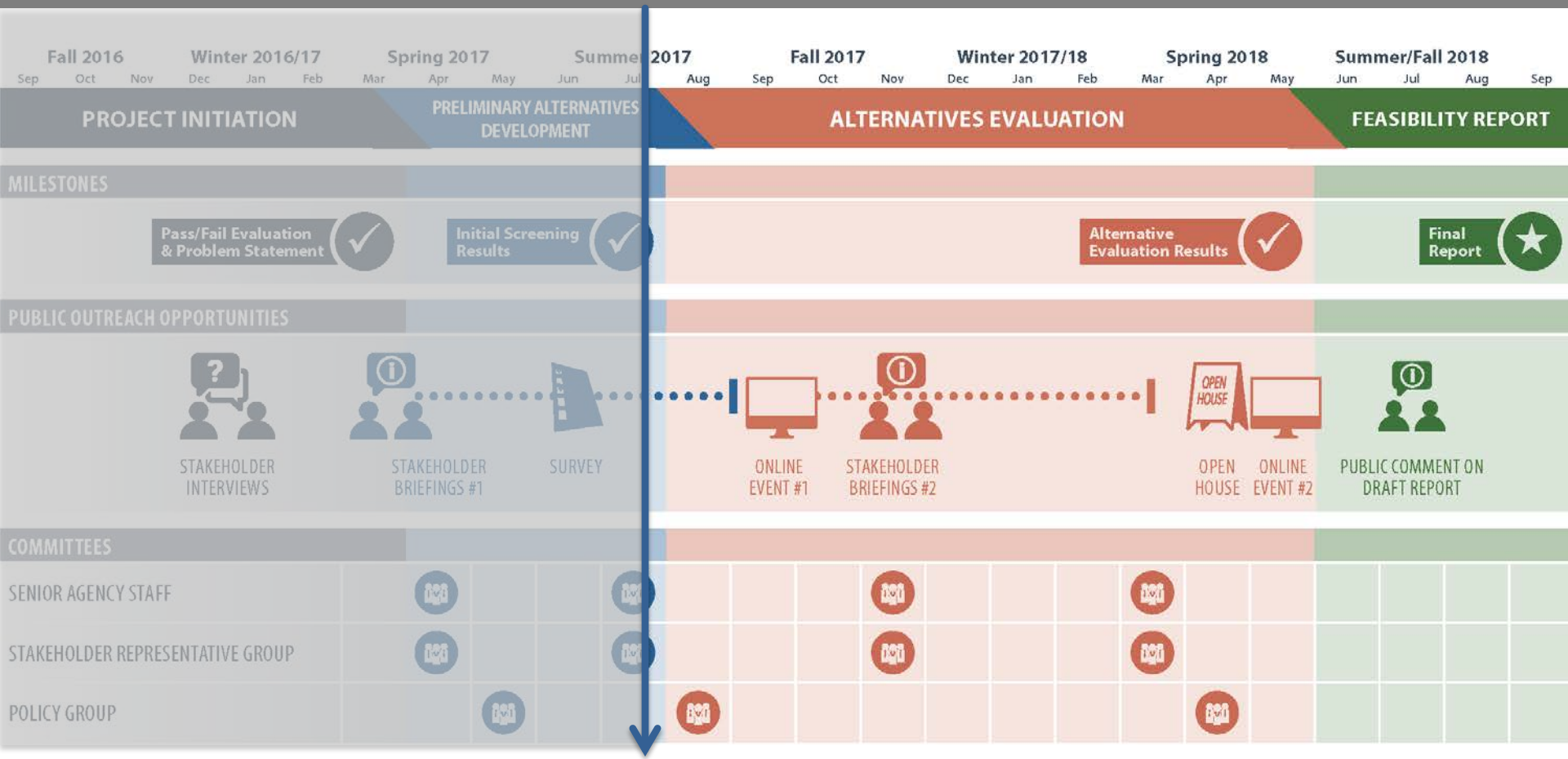
4. Alternatives Evaluation

Concepts Development - Example





5. Schedule Review



We are here

6. Closing Remarks

EARTHQUAKE READY BURNSIDE BRIDGE

Thank You