Summary

City of Pacifica Beach Boulevard Infrastructure Resiliency Project

Public Workshop #3

Thursday, February 4th, 2021

6:00 – 8:30 p.m.

Welcome, Introductions and Agenda Review

Mary Bier, Mayor Pro Tem of Pacifica, opened the meeting by welcoming attendees and thanking Ryan Marquez, City of Pacifica Public Works Department, and the Beach Boulevard Infrastructure Resiliency Project (BBIRP) team for their continued efforts on the project.

Sue Beckmeyer, Mayor of Pacifica, indicated the opportunity the BBIRP presents in making the area a unique space for the enjoyment of residents and visitors, protecting the City's interconnected infrastructure, and maintaining Beach Boulevard's unique, vibrant, and historical character.

Kelsey Rugani, facilitator, welcomed attendees and reviewed the meeting objectives, agenda, and ground rules. The workshop objectives included:

- Providing a project overview and updates since December Community Workshop.
- Providing a summary of key findings from the Project's Multi-Hazard Risk Assessment.
- Sharing information on each alternative under consideration and the criteria that will be used to identify the preferred alternative.
- Continuing past Workshop conversations and collect participant input on the Project features and amenities toolbox, as well as the criteria related to the alternatives under consideration.

Overview of Beach Boulevard Infrastructure Resiliency Project

Ryan Marquez provided an overview of the project by introducing the project area and reviewing the City's ongoing efforts in the Sharp Park neighborhood. The BBIRP is located in northern Pacifica, on the western edge of the historic West Sharp Park neighborhood. The project area is comprised of four different reaches with unique characteristics; the Pier Wall System built in 1973, the North Wall built in 1984, the South Wall built in 1987, and the South Gap. Due to multiple major failures to the North Wall between 1984 and 2020 (including foundational and full wall failures), localized flooding and property damage from wave overtopping, and sea level rise projections, Marquez emphasized the need to update these structures in order to protect public infrastructure along and adjacent to Beach Boulevard.

Marquez continued by explaining the project goals of the BBIRP, which include:

- Replacing the current seawall and outdated infrastructure.
- Building climate resilience into one of the most vulnerable segments of the City's shoreline.
- Improving public access and use of the Beach Boulevard Promenade.
- Creating a multi-benefit solution to protect public infrastructure, recreational activities, homes, businesses, and the community at large, from further coastal erosion impacts.

Figure 1 Project Phases

The project is broken into three phases. The current phase, Phase 1, focuses on preliminary planning and feasibility and includes reviewing Existing Conditions and conducting a Multi-Hazard Risk Assessment (MHRA) which will inform the development and analysis of the project alternatives. Once a preferred alternative has been identified, Phase 2 will focus on design and permitting. Phase 3 is the construction phase.

Marquez indicated that there will be a total of four community workshops during Phase 1. The first and second workshops focused on the Existing Conditions of the project area and MHRA, respectively. The final workshop, anticipated to occur in March or April, will present the preferred alternative for the BBIRP. Online engagement and information will occur throughout the duration of the project.

Marquez then summarized discussion topics that have come up during and after previous workshops, which include:

- Project funding and cost to Pacificans.
- Alignment between City's planning efforts (e.g. Local Coastal Plan and the Sharp Park Specific Plan) and the requirements of regulatory agencies.
- The potential for the BBIRP to serve as a catalyst for commercial development and private investments in Pacifica.
- BBIRP construction timeline (e.g. phasing to address priority areas).
- How recreation is being evaluated as project alternatives are analyzed.
- Requests for additional details on economic impact, costs and amenities associated with each project alternative, long-term and large scenario planning and real-world examples of the project alternatives.

Question and Answer

Following the presentation, participants were given the opportunity to ask questions to the Project Team. A summary of the questions is included in Appendix A.

Overview BBIRP Range of Alternatives

Paul Henderson, GHD, provided an overview of the outcomes of the MHRA and began by describing the hazards and risks the project area faces if not action is taken to update existing infrastructure (e.g., the no project alternative). These include:

- Hazards
    - **Coastal Flooding** is caused mostly by wave overtopping. During a 60-year event, total water levels are significantly higher than the seawall crest creating a flood hazard zone that could extend up to 200 feet landward on the North Wall and 75 feet landward on the South Wall.
    - Pacifica's bluffs are susceptible to **coastal erosion** as they are made of loosely consolidated materials that are highly erodible. To predict how the beach and bluff could erode without sea level rise, the project team used a background erosion rate of 1.6 feet per year.
    - **Scour** is another form of erosion that occurs during flooding events. Rock revetments in front of the existing seawall serve as protection against scour.
    - **Earthquake risks** exist given the City's proximity to the San Andreas and San Gregorio faults. In addition to strong ground shaking and ground surface rupture, additional risks include liquefaction and slope failure of the coastal bluff. Liquefaction occurs when water saturation and pore pressure increase reduces the strength of subsurface soils. Slope failure risks exist as ground shaking can erode coastal bluffs to the extent that they collapse.
    - **Sea-Level Rise** increases the severity of the hazards listed above. The project team utilized 2ft, 3.5ft and 7ft sea level rise scenarios to determine risk aversion scenarios for the project's design life.
- Risks
    - **Public Safety** risks occur given the increase in overtopping events. Specifically, this would entail flooding of the promenade, causing hazardous conditions for pedestrians, vehicle traffic, homes, and businesses.
    - The lack of **shoreline protection infrastructure** imperils the viability of the Beach Boulevard corridor and, subsequently, would result in the degradation of the **environmental and social** assets in the project area.
    - A no project alternative would result in severe **economic** implications, including upwards of hundreds of millions of dollars in property damages by 2100.

Gillian Millar, GHD, provided an overview the range of alternatives currently be analyzed. Millar began by describing the criteria the project team is utilizing to assess each alternative. These criteria include:

- Whole of Life costs (capital and maintenance)
- Safety (pedestrians, vehicles & public spaces)

- Environmental resource protection and promotion
- Public access & recreation
- Preservation of coastal views & community character
- Reliability & resilience to Sea Level Rise
- Adaptability to future challenges

Rugani introduced a virtual polling exercise to collect attendees' feedback on the relative importance of the selection criteria. Poll results are listed below:

Which Alternative Selection Criteria are of most importance to you?

- Life-cycle costs: 40% (17 out of 42 votes)
- Safety (pedestrian & public access): 33% (14 out of 42 votes)
- Environmental resource protection: 52% (22 out of 42 votes)
- Public access & recreation: 36% (15 out of 42 votes)
- Preservation of coastal views & community character: 36% (15 out of 42 votes)
- Resilience to Sea Level Rise: 79% (33 out of 42 votes)

Millar explained that the design criteria used in assessing the BBIRP alternatives include design life, flood protection, and maintenance and operation requirements. This criteria is a non-technical requirement which is used to establish a baseline of performance across all alternatives and their individual technical feasibility.

Millar continued by summarizing the features of each of the project alternatives under consideration as well as tradeoffs associated with them.

- Alternative #1 – No Project: This alternative would entail not taking any action to improve or replace existing infrastructure within the project area, subsequently leaving the area susceptible to all the risks and hazards discussed above. A no project alternative is required as means to establish baseline conditions for analyzing other project alternatives.
- Alternative #2 – Beach Nourishment: This alternative involves maintaining the existing beach through the importation of sand. While this alternative maintains beach access and recreation, there are some tradeoffs, including:
    - High wave movement in the project area, leaving it susceptible to erosion.
    - Large volumes of sand will be needed indefinitely. The source of this sand is uncertain and there is no guaranteed availability of the volume needed in the future.
    - Potential for escalation of cost over the design life.
    - Repairs to the existing seawall will still be required to maintain functionality and flood protection.
- Alternative 3 – Sand Retention Structure: This alternative allows for the slowing of loss of beach materials and reduces the force of wave climate. However, it must to be combined with beach nourishment to be a viable option which increases project costs. Additionally, it poses public safety concerns and, like beach nourishment, would still require repairs to the existing seawall to maintain functionality and flood protection.

- Alternative #4 – Replace Seawall: This alternative maintains the functionality of the promenade and is comparably low maintenance. Tradeoffs for this alternative compared to others include at visually engineered design of the infrastructure and the requirement for specialized, more expensive construction.
- Alternative #5 – Rock Revetment: This alternative is adaptable to projected increases in sea level rise and has the lowest maintenance needs of all alternatives being considered. Tradeoffs with this alternative include a mandatory, impermeable wall behind to alleviate flooding and restriction of public access to the beach.

Millar concluded by noting that, ultimately, these alternatives can be combined as the BBIRP is implemented and constructed.

Question and Answer and Virtual Polling Session

Following the presentation, participants were given the opportunity to ask questions to the Project Team. A summary of the questions is included in Appendix A.

Rugani introduced a series of poll questions to collect attendees' feedback on the tradeoffs associated with each alternative and an acceptable level of flooding within the project area. Responses to these questions are included below.

A height increase in the protection structure will likely be needed to decrease wave overtopping and accommodate sea-level rise. Understanding that an increase in height may impede existing coastal views, what is an acceptable range of height increase?

- 0 to 2 feet: 21% (10 out of 48 votes)
- 2 to 4 feet: 35% (17 out of 48 votes)
- 4 to 6 feet: 6% (3 out of 48 votes)
- However much it takes to prevent overtopping safety risks: 38% (18 out of 48 votes)

What is an acceptable amount of wave overtopping of a protection structure and flooding of the promenade?

- Water splashing over wall resulting in the promenade or roadway being visibly wet but no ponding water: 35% (17 out of 48 votes)
- Moderate splashing over wall resulting in some ponding water on the promenade and roadway: 48% (23 out of 48 votes)
- Conditions similar to those experienced in December 2020 - Severe splashing and some infrequent waves (flowing water) over the wall. Hazard to walk for vulnerable populations (i.e. elderly, children): 10% (5 out of 48 votes)
- Persistent flowing water over the wall. Hazard to walk for most: 6% (3 out of 48 votes)

Based on your previous answer, what is an acceptable frequency of this event?

- Commonly - Several times a month in the winter (during high tides): 44% (21 out of 48 votes)

- Occasionally - A few times a year (only during highest tides and strong swell events): 48% (23 out of 48 votes)
- Very infrequently - Only a few times every 10 years: 2% (1 out of 48 votes)
- Rarely - Only a few times every 30 years: 5% (3 out of 48 votes)

Public Space Opportunities

Lucas Piper, GHD discussed the options for the use of the public space in the project area. The public space opportunities presented are based on the assumption that a new, elevated seawall becomes the preferred alternative.

The public space opportunities are organized into two zones, as illustrated in Figure 2 below. Zone 1 pertains to the North Promenade and Zone 2 encapsulates the Southern Park.

Figure 2 Public Space Opportunities Sections

Piper explained that the North Promenade is the area between Beach Boulevard and the existing seawall. Existing conditions for sections in Zone 1 include:

- Section A
  - Seven parking spaces between Paloma and Montecito;
  - An approximately 13 foot wide paved promenade;
  - Existing protection structure at an elevation of 30 feet; and
  - Various pedestrian amenities (e.g. benches, lighting, bollards, etc.)
- Section B
  - Seven parking spaces between Paloma and Montecito;
  - An approximately 13 foot wide paved promenade;
  - Existing shoreline protection structure at an elevation of 25 feet; and
  - Various pedestrian amenities (e.g. benches, lighting, bollards, etc.).

Piper then described the three public space opportunities being considered for Zone 1, as summarized below:

- Enhanced Walkway Option: Pedestrian optimized space, allowing for wide, multi-use circulation, gathering, and ocean viewing.
- Green Corridor Option: Balances pedestrian walkway with creation of greenspace planters.
- Parking Access Option: Allows for street-level parking, promenade access, and planting areas at select intersections and designated parking areas.

Rugani introduced a polling exercise to determine attendees' preferences for the public space opportunities at the North Promenade. The poll results are summarized below.

Based on the options provided for the Northern Promenade, please indicate which option you most prefer:

- Parking Access: 14% (5 out of 37 votes)
- Enhanced Walkway: 52% (20 out of 37 votes)
- Green Corridor: 32% (12 out of 37 votes)

Based on the options provided for the Northern Promenade, please indicate your second preferred option:

- Parking Access: 11% (4 out of 37 votes)
- Enhanced Walkway: 57% (21 out of 37 votes)
- Green Corridor: 32% (12 out of 37 votes)

Based on the options provided for the Northern Promenade, please indicate your least preferred option:

- Parking Access: 41% (15 out of 37 votes)
- Enhanced Walkway: 27% (10 out of 37 votes)
- Green Corridor: 32% (12 out of 37 votes)

Piper then provided an overview of the public space opportunities for the Southern Park (Zone 2). The Plaza Park option entails a conceptual landscape design approved by the Pacifica City Council in August 2020. Specific components include:

- Seating and picnic areas
- Trellis shade area
- Public art
- Bike parking
- Fitness workout stations
- Educational signage/kiosk
- Landscaping areas

The Beach Expansion option includes a minimal paved plaza adjacent to parking areas thereby allowing for new beach expansion between the new plaza and the ocean. Specific components of this option include:

- Shoreline protection structure realigned to the east
- Extend the north promenade into park
- Expand beach to new realigned shoreline protection structure
- Beach access
- Entry nodes/kiosk opportunities
- Educational interpretative signage

Rugani introduced a polling exercise to determine attendees' preferences for the public space opportunities at the Southern Park. The poll results are summarized below.

For the Southern Park Area, please choose which option is more favorable to you.

- Plaza Park: 59% (26 out of 44 votes)
- Beach Expansion: 41% (18 out of 44 votes)

Question and Answer

Following the presentation, participants were given the opportunity to ask questions to the Project Team. A summary of the questions is included in Appendix A.

Public Comment

Rugani invited members of the public to provide comments to the project team. A summary of the public comments made is included below.

- The 2016 San Francisco Littoral Cell Coastal Regional Sediment Management Plan report from the US Army Corps of Engineers notes there are significant data gaps that hamper adaptation planning, particularly for sediment transport. Is there information missing that you need in order to properly evaluate the alternatives under consideration? If those data gaps have been addressed since 2016, can those be made publically available?
- Has modeling been done that shows the impacts of coastal armoring revetments and seawalls in the BBIRP project area and elsewhere in Pacifica?
- We all know that periodically we have a very energetic and active shoreline. What I would like to see are real world examples of the alternatives being considered and the extent to which they have ensured coastal resiliency.
- As it relates to public space opportunities for the North Promenade, it sounds like we may be getting rid of street parking but they will still be vehicle access. With the options presented, Beach Boulevard would need to be elevated several feet in order to maintain a line of sight to the ocean for those driving in the project area.
- I would love to see more outreach conducted to those living along and adjacent to Beach Boulevard. I would also like more clarity on the timeline for the BBIRP's construction. I feel like conditions are getting worse every year and my general understanding is that temporary fixes are being undertaken.
- Those living in the proximity of the project area need to be asked about the height of a potential new wall. If I lived on Beach Boulevard, I would agree to sacrifice the view.
- A modern seawall is fundamental for ensuring the resiliency of Beach Boulevard. The cost of inaction would be hundreds of times more expensive than constructing a new wall, particularly when considering the threat to utilities, homes, small businesses, and tourist attractions in the area. A seawall is also needed for ensuring investments in a future hotel, which is a key component for ensuring financial sustainability. I urge Pacifica residents and our City Council to work together to construct a modern seawall along Beach Boulevard in a timely manner. It is not an exaggeration to say the future of Pacifica rides on a modern seawall along Beach Boulevard.
- A US Army Corps of Engineers study indicates that a new seawall is not worth the investment. Subsequently, they would not contribute funding for one. Does the City know about this study?

- Has the City started planning for renovation needs in the project area on the chance that funding could dry up? Is there anything on paper to show that the City is working to not only protect Beach Boulevard but the majority of citizens? Who will end up with backed-up sewers? Will the pump station be protected?
- It seems that the plans for the promenade will literally cement-in the utilities that this project is designed to protect making it more costly to move this infrastructure in the future. Moving this infrastructure should be part of the plan.
- It seems that the plans for the promenade will literally cement in the utilities that this project is designed to protect making it more costly to move this infrastructure in the future. Moving this infrastructure should be part of the plan. One of the alternatives should be an immediate repair to the existing seawall and long-term considerations for more infrastructure.
- I am supportive of a long-term view of this decision that includes near-term fixes to the existing seawall. Additional criteria I would like the City to consider include costs for moving utilities and a 100-year financing strategy.
- The seawall and promenade are valuable given their economic and communal value. We have not addressed how much taxpayer money would be needed if we moved the utilities in the project area. We cannot acquiesce to managed retreat; we need to move forward. The promenade is a major destination for tourists and locals alike and we need to keep that in mind.
- I have heard some people call for marshes and living reefs, but the project area is too narrow for those features and have safety implications for Sharp Park residents. Maintaining the promenade ensures safety and public access, which are of the utmost importance.
- I would like to second the comment for more outreach to residents within the proximity of the project area. Protecting Beach Boulevard is an urgent matter, particularly given the recent storms. We need to focus on near term solutions, especially since funding for more long-term solutions has not been identified.
- I think I represent the majority of Pacificans insofar as that we are looking forward to seeing a new seawall and preserving utilities and the promenade.
- We cannot ignore that whatever alternative is ultimately selected will impact all of Pacifica's shoreline and beyond. We also need to protect small businesses, many of which, including restaurants, are dependent on those who visit the beach. Pacifica is becoming less and less beautiful with all the more concrete being added; it is harder to enjoy the natural areas of Pacifica with the expansion of the built environment. I would ask the City Council to keep that in mind as they decide which businesses they prefer to support.

Next Steps

Rugani reviewed the following next steps before concluding the meeting.

- Participants were encouraged to visit the project website to:
    - Find the summary and recordings from the September 24 and December 3 Workshops.
    - Complete the workshop worksheet.
    - Sign-up for the project email list.
- The next Community Workshop will take place in March/April and focus on the Final Project Alternative and other project updates.

Appendix A: BBIRP Community Workshop #3

Questions, Comments and Responses Summary

The City received questions regarding the phase of work presented before and during the workshop. Some of these questions were answered live and some were answered post workshop.

In the interest of providing the community with detailed responses, the team has assembled a list of the questions asked and comments provided during the meeting for inclusion in the workshop summary. The questions, comments and responses detailed in this document are not necessarily verbatim, but convey the intent of the questions and comments, and where possible the team has provided more detailed responses than were possible during the workshop.

The entire workshop was recorded and is publicly available on the project website for anyone who wishes to hear the actual questions, and comments and responses.

Questions have been grouped into common themes, along with the associated responses. Again, the entire workshop was recorded, questions can be reviewed in chronological order via the recording if desired.

The BBIRP Workshop #3 recording can found at: https://youtu.be/H1Aqp8x6Op0

Alternatives Analysis

1. (Q) The poll isn't showing all the responses on my screen. You don't offer a response that offers an alternative to the wall.
    i) (A) The design team are currently looking at high-level concept options consistent with Coastal Resilience Sub-area Policies and Programs described in Section 6.6 of the Local Coastal Land Use Plan (LCLUP) Certification Draft – February 2020 (https://www.planpacifica.org/local-coastal-program). The objective of this alternatives analysis is to determine which is more feasible (sand retention, beach nourishment, sea wall or rock revetment). If ultimately a seawall is the selected alternative, different wall types will be assessed. As discussed in the presentation, it is possible that the final preferred project will be a blend of several alternatives.
2. (Q) It is important to consider other alternatives. For example, looking at what we are missing in terms of resilience, thinking about composites/hybrid, etc. so options such as moving the infrastructure and strengthening the wall will be easier and lower cost.
    i) (A) There is a lot of discussion about long-term planning encompassed in the LCLUP. The BBIRP project is focused on a 50-year planning horizon. The project alternatives were developed to be consistent with Coastal Resilience policies described in Section 6.6 of the LCLUP Certification Draft. These policies describe several adaptation strategies that could be implemented to protect public infrastructure and important access and recreational resources like the Promenade and Pier for the likely range of sea level rise expected over the next 50 years (i.e. less than 2 feet of SLR). The objective of the alternatives analysis is to determine which is more feasible (sand retention, beach nourishment, sea wall or rock revetment). Based on the outcome of this analysis, it is possible that the final preferred project will be a composite/hybrid of several alternatives. For example, if a seawall is

selected as the preferred alternative, different wall types will be assessed, potentially in combination with other strategies such as beach nourishment or relocation of sensitive infrastructure.

3. (Q) What is the cost difference between all the alternatives? To give us an idea of upfront and maintenance costs.

    i) (A) Part of the work of developing the alternatives is to estimate the costs. The benefit cost analysis is one of the key tools for comparing and evaluating alternatives. The cost estimates for each of the alternatives will be shared once developed, and at BBIRP Public Workshop #4.

    ii) (A) In general we look at both the cost of initial capital investment (upfront) and operations & maintenance costs (O&M) over the life of the project. Regarding upfront costs the rank from highest cost to lowest cost is likely to be 1. Sand Retention Structures, 2. Beach Nourishment, 3. Seawall, 4. Revetment. Beach nourishment and sand retention alternatives will require ongoing nourishment events to maintain target beach widths, each having significant costs, approximately every 5-10 years (depending on conditions). In comparison, the ongoing O&M costs for seawall or revetment are significantly lower. More detail on the initial cost and life-cycle cost of these alternatives is forthcoming.

4. (Q) Is the berm, south of Clarendon, being considered in these assessments? Whether the berm will be able to protect the community and not degrade further or whether the seawall protection could be impacted by not continuing further south. I am aware the berm is a different jurisdiction (SF) however it's the same beach.

    i) (A) We are in communication with SF Parks & Rec, who own and maintain the berm, regarding this project and their future plans. All of the design alternatives being assessed will address the 'gap' between the existing seawall and the berm to the south. At this time the project is not assessing the current or future condition of the berm. For now, we will be assuming the berm will be maintained in at least in its current condition.

5. (Q) For the Green Corridor Option, it would be hard to maintain the landscaping. We have tried before and it would be a problem. For the two options for Plaza Park and expansion of the beach, it has to be elevated to provide the adequate protection. The way it is now everyone is at risk of flooding. It needs to be the same as the North End.

    i) (A) As part of the assessment of flood protection measures the design team will be assessing the protection height needed to attain the desired level of protection. Of course, the height needs to be balanced with the recreational function of the south plaza, which is also being considered as part of the assessment.

6. (Q) Can we have more conversation around how high this wall is going to be? It looks like visibility from the ocean is being removed.

    i) (A) The height of seawall and impact on view corridors will be a key trade-off to consider for this alternative. Preliminary analysis indicates a seawall crest elevation of 30 feet (NAVD88) would be required to protect against a 60-year return period event in combination with 2 feet of sea level rise north of the Pier. This would be an increase of 0-4.5 feet above the existing crest elevation which varies from 25.5 to 31.5 feet NAVD88 north of the Pier.

7. (Q) Why has the City not done rock mining? Is it apparent that the rocks on the South Wall are not contributing to protection and that they could be broken and used for protection as a short-term solution?

    i) (A) The rock revetment fronting the south wall is essential to the stability of that coastal protection structure. The wall foundation was not designed to withstand scour during extreme storm events. The rock, although sometimes covered by sand is necessary to limit the potential for scour to undermine the concrete wall. It is common for individual stones to be displaced as a revetment is subject to significant wave attack during extreme events. Displaced stones often end up seaward of the revetment. However, these stones do not represent a large quantity of material that could be sourced for other locations. Typical revetment repair and maintenance practices involve excavating the displaced stones and re-integrating them into the rock matrix to form an interlocked and stable revetment to resemble the original design. The City has done such mining from time to time along Beach Blvd.

8. (Q) There was talk about closing the gap between the current seawall and the berm at Clarendon, is that part of this project?

    i) (A) See response to Question 4.

9. (Q) (Cliff) Why don't we have a wall that has a curve back out toward the ocean?

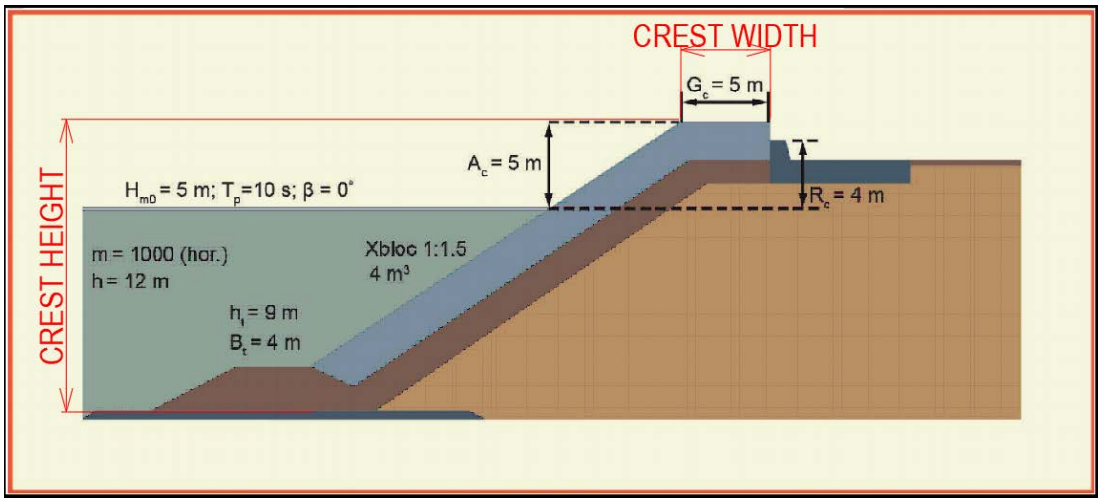
    i) (A) A recurved wall can be an effective feature to reduce the wave overtopping volume. However, the large and long period wave energy experienced along most of the project reach may limit the benefits of this feature. If a seawall is identified as the preferred alternative, different wall types will be assessed, including the use of a recurved feature to reduce the wave overtopping and potentially lower the required crest elevation of the structure.

10. (Q) It seems to me that we have some critical tradeoffs in front of us. If our goal is safety above all else, we would have to accept a higher wall. Keeping the promenade accessible is also critical, but I don't know how we will accept anything else other than the most safe and accessible option. Is there any other option other than a higher wall?

    i) (A) Yes. All of the alternatives being assessed by the team need to be compared in an 'apples to apples' way, meaning that they offer an equal level of protection for comparison. Accessibility and protection are certainly being considered.

    ii) (A) Crest height is not the only metric that changes things. The crest width and crest type also matters, whether we're talking about a revetment, or a wall.

    iii) The following diagram, adapted from EurOtop 2018 is provided to assist with crest heigh and crest width definitions



11. (Q) When we talk about raising the elevation of the seawall, somebody had brought up that the driving views will be blocked? Currently we have handrails, that are the barriers between the seawall and the water, are those still considered? Is it a concrete wall? Can you tell us more about how it would look?

    i) (A) We are not quite there yet, once we understand the preferred alternative, then we will develop barrier types.

    ii) (A) Impacts to views from the road will depend on the design of the preferred protection structure. If seawall replacement is preferred, it is likely that an elevated wall crest will be included to mitigate overtopping. In this case, yes, it is likely that views from Beach Boulevard, including from a vehicle, will be impacted.

12. (Q) Please provide two examples of seawalls in similar conditions to Sharp Park. Please use examples other than Ocean Beach. Those conditions are not similar, except for the south end which SF has decided to abandon. Thank you. (This question was asked a number of times)

    i) (A) See response to Question 16.

13. (Q) In any of those alternatives or combinations of, what happens to the bordering beaches? Does it change wave forces and action on land and neighborhoods that border the geography of this specific project?

    i) (A) Potential impacts to adjacent beaches have not been evaluated in detail, but there are typical concerns associated with each project alternative. For example, shoreline protection structures (revetment and seawall) prevent erosion of the bluffs and therefore have a passive impact on regional sediment supply. A detailed analysis of adjacent impacts is typically conducted during the detailed design phase of the preferred project in support of the environmental documentation and permitting process.

14. (Q) How will the seawall alternative impact beach and bluff erosion (e.g., adjacent non-fortified shoreline like the Sharp Park berm and Mori Point)?

    i) (A) See response to Question 13

15. (Q) Does the pier in any way act as a groin? Are the waves going in and out stopped by the pier supports?

    i) (A) No, the Pier does not act as a groin. The wide spacing of bents and piles does not disrupt the natural flow of sand. However, Pier structures can influence currents in the nearshore resulting in some influence on the location, shape and configuration of sandbars and rip currents.

16. (Q) We all know that periodically we have a very energetic and active shoreline. What I would like to see are real world examples of the alternatives being considered and the extent to which they have ensured coastal resiliency.

    i) (A) The proposed project is still in development and will be further defined as a result of the alternatives analysis. Below are a few examples of where structural solutions have been implemented locally:

    ii) (A) Pacifica Seawall – the Beach Boulevard seawall south of the Pier is an example of an effective shoreline protection structure that still has a dry beach area during summer months.

    iii) (A) Ocean Beach Seawall – another example of a vertical structure providing “last line of defense” protection for upland development

    iv) (A) Rock Revetment – multiple examples north of project area along Esplanade

    v) (A) Sand retention and beach nourishment alternatives are less common in this region but a few examples are provided from southern California. These alternatives would require a wider beach and larger armor stone to be effective in the more energetic wave environment of Pacifica.

    vi) (A) Santa Monica & Venice beaches: Groins & breakwaters provide effective shoreline stabilization. Beach was widened by over 500 feet with multiple nourishments total 14 million cubic yards between 1945 and 1960.

17. (Q) The options presented in the workshop seem very basic or boilerplate. When does a more meaningful analysis of all the alternatives occur?

    i) (A) The alternatives presented in Public Workshop #3 are concepts designed only to a basic concept level for initial consideration. Following Workshop #3 the team is further developing each of the alternatives to meet key design criteria. An example of the design criteria is the acceptable volume of overtopping. Each alternative will be designed to provide the same level of overtopping protection so that we can 'compare apples with apples'. In Public Workshop #4 all of the alternatives will be presented, along with the analysis of each alternative, including materials, geometry, costs, reliability etc.

Long-Term Planning

18. (Q) How were the project objectives determined? Why isn't the objective "climate resiliency at the lowest cost" which seems like the need to me?

i) (A) The project approach, objectives and alternatives were developed in accordance with the goals and policies described in the LCLUP Certification Draft. The alternatives analysis will provide an indication of the relative costs associated with climate resiliency for each alternative. Cost is an important element of the multi-criteria analysis but not the only factor that will be considered.

19. (Q) Is managed retreat still on the table in this discussion?

    i) (A) The project approach and alternatives analysis were developed in accordance the goals and policies described in the LCLUP Certification Draft. Regarding managed retreat, the LCLUP explicitly states "the City has rejected managed retreat as a sea level rise adaptation policy" (LCLUP page 6-11). However, the team recognizes that analysis of managed retreat will be necessary to satisfy California Coastal Commission requirements for environmental reviews. The No Project option does look at a very similar scenario to managed retreat and thus will be compared to the project alternatives to provide a comparison of feasibility and costs associated with this scenario.

20. (Q) None of these alternatives include moving the infrastructure that's at risk. Why not? Shouldn't there be an alternative, maybe a less intense seawall that includes moving the infrastructure?

    i) (A) The alternatives were developed to be consistent with Coastal Resilience policies described in Section 6.6 of the LCLUP Certification Draft. These policies describe several adaptation strategies that could be implemented to protect public infrastructure and important access and recreational resources like the Promenade and Pier for the likely range of sea level rise expected over the next 50 years (i.e. less than 2 feet of SLR). The No Project scenario, described in the MHRA, evaluated the cost of relocating the utility infrastructure in the event existing shoreline protection failed or was removed. Relocation of infrastructure is not a stand-alone alternative because it doesn't address other vulnerabilities along the project reach. Other infrastructure like the Promenade and Beach Boulevard cannot be relocated and would experience damage from erosion and flooding if the coastal protection strategy failed. The alternatives considered at this stage of the project are intended to capture the range of typical coastal protection strategies applied in this type of environment and consistent with the LCLUP. If ultimately a seawall is the selected alternative, different wall types will be assessed, potentially in combination with other strategies such as beach nourishment or relocation of sensitive infrastructure. Relocation or replacement of city-owned utility infrastructure will be considered when a particular asset approaches the end of its useful life and will be informed by the effectiveness of coastal adaptation strategies implemented along the Beach Boulevard corridor and updated sea level rise projections.

21. (Q) I'm confused because I thought we were just looking at replacing the wall at South Park given budget constraints? Are we looking at a long-term plan?

    i) (A) Currently, the scope of this project includes assessing the entire length of seawall along Beach Boulevard, both north and south of the Pier. The BBIRP project is focused on a 50-year planning horizon. The project alternatives were developed to be consistent with Coastal Resilience policies described in Section 6.6 of the LCLUP Certification Draft. These policies describe several adaptation strategies that could be implemented to protect public infrastructure and important access and recreational resources like the Promenade and Pier

for the likely range of sea level rise expected over the next 50 years (i.e. less than 2 feet of SLR). Additional or modified adaptation strategies may be required over longer planning horizons is response to updated scientific projections and the effectiveness of near-term adaptation strategies. Long-term plans will continue to be refined pursuant to monitoring and planning efforts outlined in the LCLUP.

22. (Q) The questions that Peter is posing are quite important. We need to have a long-term plan which would help inform the design and quality of the plan. What is the timeline we are looking for? We need a clearer definition on exactly what we are we planning to solve.

    i) (A) See response to Question 20.

23. (Q) Don't we want to have plans already in place for what to do when things go wrong unexpectedly? Yes, they may be a low probability now, but there would be really dire consequences if they happen. I don't think the justifications offered are convincing.

    i) (A) Yes, the project will have a plan in place to implement additional strategies or modified strategies in response to updated scientific projections and the effectiveness of near-term adaptation strategies. See response to Question 20 for a discussion of planning horizons and the long-term approach to coastal resilience.

24. (Q) The SFLLC says in its conclusion section ES.8 that "there are significant data gaps that hamper future shore conditions and adaptation planning. In particular, sediment transport in Pacifica and Daly City has not been studied in sufficient detail." Again, I just want to make sure that the necessary scientific data for a thorough analysis can be secured prior to decisions being finalized.

    i) (A) Thanks for the clarification. GHD and the City are aware of the Regional Sediment Management Plan. Part of GHD's task was to review existing data and documents and identify gaps that need to be addressed for this project. The project team did not identify that as an area of concern for the project at this time. As the area does not currently supply sand to the littoral cell, a replacement project would not decrease sand supply. Further discussion is also included in the response to Question 51.

25. (Q) A US Army Corps of Engineers study indicates that a new seawall is not worth the investment. Subsequently, they would not contribute funding for one. Does the City know about this study?

    i) (A) The City is aware of the USACE preliminary Federal Interest Determination. That study was limited in scope and funding and was not able to assess the area in the manner the City is approaching it. Just because the USACE didn't find a federal interest at that time, does not mean the project is not justified or needed. This project is a priority for the City of Pacifica City Council."

Project Procedural, Scope, & General

26. (Q) I had given comments and questions through your post presentation survey after the December meeting, but never heard back from anyone. Should I expect a response?

    i) (A) Yes, all questions and comments provided in the post-meeting survey will be addressed.

27. (Q) How much work would we be doing to encase the infrastructure that's there to keep it in intact?

i) (A) One of the primary drivers of the project is to replace the existing wall with a reliable and resilient shoreline protection strategy. In theory, the utilities will not need significant work because they are afforded protection by the new project.

28. (Q) How will businesses be impacted if visitors who come for recreation like surfing, decline as the beaches disappear and the beauty gives way to a concrete and stone shoreline bordered by asphalt?

    i) (A) Recreational opportunities, including surfing, are an important element of consideration in analyzing the project alternatives. Alternatives like beach nourishment and sand retention structures could help mitigate the adverse impacts of long-term erosion and sea level rise on the economic benefits associated with beach recreation and surfing.

29. (Q) What is the timeframe for each of the alternatives? That is a consideration as well. To be more specific - when would each alternative be completed, if done singularly?

    i) (A) Funding and permitting are key items on the schedule for delivery of the project, both of which make providing a defined schedule difficult at this time. Currently the City is hoping to commence construction as early as 2022, with a completion date to be determined, depending on the selected alternative and the construction phasing i.e. the north and south shoreline protection could be built at the same time, or a number of years apart.

30. (Q) Glad to have joined in to see what the City is looking to accomplish for us. I believe we can get to a great solution that will allow us to still access the ocean.

    i) (A) Noted

31. (Q) The Army Corps of Engineers in its January 2018 Federal Interest Determination report on the sea wall said that the sea wall maintenance costs since original construction were approximately 1.75 million. I know the last few years have incurred some fairly major additional repair costs. Can you give us current numbers for wall repair, even if it does not include the other regular maintenance? I've been told that the existing sea walls were supposed to have a design life of 75 years, and yet did not make 1/2 that before major repairs were needed. Where is the accountability and how can we prevent this from happening again?

    i) (A) The City does not have all cost associated with sea wall maintenance since it being built available at this time. From the feasibility documents of the north and south wall, they were expected to have a design life of 50 years. It has been 37 and 33 years since construction of the north and south wall respectively. The existing conditions report projects out 5-20 years of remaining service life on the north wall and 10-20 years remaining service life on the south wall. Those numbers do align closer to a 50-year design life that was originally planned. However, as time goes on the wall damage frequency and magnitude could increase, especially along the north wall where the wall has shown to be more susceptible to failures. At this point, this project is looking holistically at the area to come up with a comprehensive plan rather than analyzing in segments.

32. (Q) Can you also confirm if environmental review will be required once a design direction has been finalized? I think I understand that it is not required for a replacement project, but as the design is not in-kind replacement - potentially deeper footings, taller walls, I would think environmental review would be necessary. Also, what is the backup plan if sea wall funding is not

able to be secured, especially given that the Army Corps was not able to proceed with the project due to such large cost/benefit disparities? Wise planning obviously dictates working on several scenarios in case the preferred option is not viable.

   i) (A) The project will need to undergo environmental review during the design process. Things of course change, but plan b would be to continue to maintain the infrastructure along the area while funds are sought. However, that is why it is important to continue to build the project need with the work we are doing now. This work will be instrumental in supporting funding assistance asks.

33. (Q) Has the City started planning for renovation needs in the project area on the chance that funding could dry up? Is there anything on paper to show that the City is working to not only protect Beach Boulevard but the majority of citizens? Who will end up with backed up sewers? Will the pump station be protected?

   i) (A) This project is doing just that. The work done during this phase is instrumental to showing why protection of the City's infrastructure is vital. This work will serve to support to the City in requesting funding the project

Promenade & recreation features

34. (Q) Right now plants don't survive here.

   i) (A) Planting will need to be carefully chosen for this area, something the team will need to take into consideration.

35. (Q) I'm confused about timelines. When I hear "resiliency", that sounds long-term, but I heard that we are looking to solve this problem now. If landscaping happens now, would it have to be moved?

   i) (A) As part of the presentation, we showed 2 different aspects of the project, one aspect being the shoreline protection, and the second aspect being the landscaping and recreation area behind the shoreline protection. As the project develops and we select a preferred method of shoreline protection the two different aspects will merge and be developed together.

36. (Q) I would love to see options of closing the street all the way to Montecito, and the rest closed for people. I think it's important to take a step back and see how Pacifica is managing traffic. It would be ideal to have BART or localized transit so people could come to sharp park without having a hassle with public transport.

   i) (A) One of the issues of closing Beach Blvd to traffic is that this would take away vehicular access to properties along Beach Blvd. Additionally, emergency access could be impacted and would need to be taken into consideration.

37. (Q) The neighbors living along Beach Boulevard need to be asked this question. "Are they willing to give up 8-10 feet of their ocean views to accommodate a tall seawall, in order to protect their properties." I think that input is important to these discussions and ultimate decisions. Can a greater outreach effort be made to possibly do a door-to-door questionnaire or poll with Beach Boulevard neighbors? I'd volunteer to help you. Thank you.

i) (A) The City knows this is a very important project for all of Pacifica's residents, particularly those along Beach Boulevard. The City has undertaken a significant stakeholder engagement program for the BBIRP that includes public outreach. The City has and will continue to provide residences along Beach Boulevard with the following opportunities to be engaged and provide feedback:

(1) Mailed postcards, social media posts, and email distributions noticing public workshops and other project information

(2) Project signs have been installed along Beach Boulevard

(3) Interviews with residents and community groups

(4) emails containing project information, if signed up to the email list

(5) Polling questions, Q&A sessions and public comment in workshops

(6) Post workshop surveys

(7) Online comment Portal

38. (Q) Please provide the full 3D renderings of the different options, not just Sections A, B, and C. Then we can look at the whole picture.

i) (A) Noted

Road & sidewalk alignment/use

39. (Q) It appears that the seawall option preserves the accessibility to the coast for everyone, including the disabled who are dependent on wheeled mobility. Is this correct?

i) (A) Yes, this is correct. The preferred design alternative will be developed, with beach access being a key feature, and will look to provide ADA compliant access.

40. (Q) Being cognizant of private property rights, does the city-owned width of the street include any further width to the east that would allow moving the street access and east-edge sidewalk eastward several feet to increase the width available for a full or greenway esplanade?

i) (A) That is something that can be assessed in the design phase of work, however having the alternative to use the sidewalk on the east side is desirable, especially during large storm events. Additionally, that may have an increased cost in realigning infrastructure in the area. At this time the City is not investigating purchase of property for use as City Right Of Way (ROW).

41. (Q) Can Beach Blvd. and the eastern sidewalk be elevated at least several feet, particularly in the area where it's currently lower, so that it is still possible to see over the new elevated seawall. Is it possible for the street itself to be elevated?

i) (A) This would of course depend on the elevation increase proposed, noting impact to access for properties on the eastern side of Beach Boulevard and conforming to the side streets. Lifting the road and promenade surface of Beach Boulevard would have significant costs, including utility replacement and/or relocation, for these reasons it is unlikely Beach Boulevard would be raised, but this can be investigated.

42. (Q) Does the City own any additional width of the street, what the city owns is larger than what it looks like, could it be move a little bit eastward?

    i) (A) Refer to responses to Question 39 and 40.

43. (Q) My question about elevating the street was meant primarily for the Northern Promenade area, not the Southern area. Can Beach Blvd. be elevated in Northern Promenade so section A and B would show the road at same level as the elevated Paved Promenade, with ramps of both sidewalks and street occurring on the ends of the East-West streets?

    i) (A) See response to Question 40.

44. (Q) Has it ever been discussed to change the purpose/function of Beach Blvd. to very limited vehicle access? I know people need access to their homes and that emergency and maintenance vehicles need access. If it is made a primarily pedestrian area, would the seawall then be able to be moved eastward and the base could be wider?

    i) (A) Any widening of a shoreline protection structure in the landward direction would require careful consideration to utilities at the same time as considering multi-modal uses and green street components. These concepts are being considered at the high level currently, and will be given further consideration as the project progresses and alternatives are refined.

Sand Supply

45. (Q) When you talk about beach nourishment, I've seen some beach work done in Holland where hey used dredges to bring the sand up and pump it to the beaches, but dredges were not mentioned in the presentation. The sand is a natural barrier to high waves, storm, etc. How can this be combined with a structure behind it? In Holland there is a structure there, but it is hidden. I am hoping we can accomplish something that looks natural but also protects.

    i) (A) We are familiar with the "sand engine" beach project in Holland. This is an excellent example of how large-scale beach nourishment can have regional benefits throughout a littoral cell. If a similar regional solution was implemented in the San Francisco littoral cell it could help provide a natural barrier to coastal erosion and flooding. The coastal setting, wave climate and littoral processes differ greatly between Holland and Pacifica, so this strategy would look different if implemented along the open coast north of Pacifica. The steep coastal bluffs and energetic wave climate make it difficult to retain a wide beach like the one observed at the Holland sand engine. An effective beach nourishment strategy in Pacifica would involve enough beach width to buffer most storm events, but there would likely be a need for a coastal structure behind the beach to withstand extreme events, or a series of moderate storm events. The pros and cons of a local beach nourishment strategy will be documented in the alternatives analysis.

46. (Q) How will sand retention structures affect the beaches that are adjacent on the coast in Pacifica, apart from this beach?

    i) (A) Sand retention structures can result in erosion to downdrift beaches due to the impacts of sand being impounded updrift of the structure and edge effects in the immediate vicinity of the structure. These impacts can be mitigated/overcome within the design of the

structure and sediment management techniques (e.g. Initial/pre-fill beach nourishment and periodic renourishment).

ii) (A) Pacifica is also uniquely positioned from a coastal perspective such that downdrift impacts are not anticipated to be significant. Longshore sediment transport along the City's beaches predominately moves from north to south, and the City is located near the southernmost end of the Littoral Cell (a compartment of sand). Mori Point headland forms a significant barrier to alongshore sediment transport which is the primary reason for the sandy beach that fronts the Sharp Park Golf Course. Therefore, downdrift impacts would likely be mitigated in part by the sediment retention benefits provided by the Mori Point headland. Monitoring and maintenance triggers for downdrift impacts can be established to mitigate these potential effects.

47. (Q) You didn't mention the erosion that occurs behind and underneath the revetment rocks over time. How much will this cost and what impact will it have on this beach and the other beaches in Pacifica, including Linda Mar?

i) (A) Erosion associated with rock revetments will be taken into consideration when developing and comparing alternatives.

48. (Q) The Plaza Park option is the only viable one because the beach alternatives depend on continuous expensive sand supply. But if you're sitting at a picnic table, you can't see the ocean, right?

i) (A) At this stage in the design, we feel that not a lot of additional sand would be needed to hold a beach in this location. This beach appears to be dynamically stable over the last decade as it benefits from the sand buildup along and against Mori Point. More study would be needed to determine the proposed beach's stability and need for sand/renourishment at this location in the short and long-term time horizons with sea level rise. A person sitting at a picnic table in the presented cross section would be able to see the ocean.

49. (Q) Gillian, I was told that Mori Point is a natural groin and helps sand retention annually on Sharp Park beach which accounts for the deep sandy beach it is especially during the summer.

i) (A) Mori Point, Pedro Point and others along the coastline are natural headlands. Groins and man-made headlines are designed to simulate natural features such as these - retaining sediment. The key issue is that there must be sand/sediment to be retained. For a frontage like Beach Blvd, we have to provide the beach material to be retained or we run the risk of either not providing the protection needed or removing sand from the system to the detriment of adjacent coastlines.

50. (Q) Pedro Point also provides a groin/ sand function to Lina Mar beach. What is your opinion of these groin functions and do you think it has a potential to reduce the loss of sand on our beaches after a new sew wall is constructed in Sharp Park? The groin information came from discussions I've had with Bob Battalio over the years about this area. Thank you.

i) (A) Similar to the previous answer. Man-made headlands are being considered under the sand retention options. The key is the sand source again. There must be sand to retain, without detrimental impact to other communities. There is no doubt that groins 'could'

reduce loss of sand on the beaches. But how effective and where the sand that is retained comes from is part of the technical analysis.

51. (Q) The 2016 San Francisco Open Coast Littoral Cell report from the US Army Corps of Engineers notes there are significant data gaps that hamper adaptation planning, particularly for sediment transport. Is there information missing that you need to properly evaluate the alternatives under consideration? If those data gaps been addressed since 2016, can those be made publicly available?

    i) (A) There are limitations in data and analysis of sediment transport patterns and volumes as described in the Coastal Regional Sediment Management Plan. However, these data gaps are common along the coast of California and are not essential to the concept level analyses at this stage of the project. As the project progresses and a preferred alternative emerges, some additional research and analysis may be necessary to better understand how these uncertainties may affect the design, performance or longevity of the project.

    ii) (A) To our knowledge these data gaps remain and there are no active studies that seek to resolve these uncertainties."

52. (Q) Has modeling been done that shows the impacts of coastal armoring revetments and sea walls in the BBIRP project area and elsewhere in Pacifica?

    i) (A) Modeling of potential impacts to adjacent beaches has not been performed. This is typically conducted after selection of the preferred project in support of the environmental documentation and permitting process.

53. (Q) Is there any sort of landscaping consideration to buffer or mitigate harsh and natural walls? It seems that there is not a lot of attention towards adding anything to the landscape if the beach is no longer accessible?

    i) (A) Later in the presentation, we'll touch on the promenade area, some possible planting, planters, and amenities. Material presented in the features and amenities section responded to this question.