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MINUTES

TO: All Commissioners and Alternates

FROM: Lawrence J. Goldzband, Executive Director (415-352-3653; larry.goldzband@bcdc.ca.gov)
Sierra Peterson, Executive & Commissioner Liaison (415-352-3608; sierra.peterson@bcdc.ca.gov)

SUBJECT: Approved Minutes of September 17, 2026 Hybrid Commission Meeting

1. Call to Order: The hybrid meeting was called to order by Chair Wasserman at 1:06 p.m. The meeting was held with a principal physical location of 375 Beale Street, San Francisco, California, and online via Zoom and teleconference.

Chair Wasserman stated: Good afternoon, all, and welcome to our hybrid BCDC commission meeting. My name is Zack Wasserman and I am the Chair of BCDC/the Commission. I want to thank the Commissioners who are here at Metro Center, as well as those who are attending virtually.

I also want to thank Vice Chair Eisen for sitting in the Chair's seat at the meeting two weeks ago when I was on vacation out of the country.

And speaking of at least missing in action, our Executive Director Larry Goldzband is on a family vacation, and our General Counsel Greg Scharff will handle his duties today.

Chair Wasserman asked Ms. Peterson to proceed with Agenda Item 2, Roll Call.

2. Roll Call. Present were: Chair Wasserman, Vice Chair Eisen, Commissioners Ahn, Dorsey (represented by Alternate M. Tam), Dumlao (represented by Alternate Pemberton), Eckerle (represented by Alternate Kimball), Eklund, Gioia, Gonzalez, Gunther (represented by Alternate Hacker), Hasz (joined after Roll Call), Lee (represented by Alternate Kishimoto), Mashburn, Moulton-Peters (represented by Alternate Cox), Nguyen, Ramos, L. Tam (represented by Alternate Gilmore), and VACANT (Nelson).

Chair Wasserman announced that a quorum was present.

Not present were Commissioners: Association of Bay Area Governments (Addiego, Taylor), Department of Finance (Benson), U.S. Environmental Protection Agency (Blake), Governor (Randolph), San Mateo County (Gauthier), Sonoma County (Hermosillo), USACE (Janoff), Senate Rules Committee (Showalter)

3. Public Comment Period. Chair Wasserman called for public comment on subjects that were not on the agenda.

Bob Hall commented: Hello, I am Bob Hall. I volunteer throughout San Francisco's park system. Once a month for the past 12 years I have been cleaning up plastic bits with the Bird Alliance along the Bay at Crissy Beach. There is an artist among our group who created this portrait of an endangered snowy plover with the plastic we found out there. You see, these plastic bits get tossed in the sea and sometimes get mistaken as food by shorebirds.

Plastic like this artificial turf in my bucket here, which I collected at one of the San Francisco soccer fields, it breaks down into microplastics and nano plastics, and it persists in the environment for decades. The Department of Toxic Substances Control says that artificial turf fields shed about 2-3,000 pounds of microplastic a year. Some fields are right on the edge of the Bay, like Pickleweed Park and Tom Bates Regional Sports Complex. Homeowners and landscapers along the Bay are also spreading this toxic plastic material.

Microplastics and nano plastic particles are found in virtually every organ of the body. These particles have two main components: polymers, number one, and additives and other chemicals, number two, like PFAS, phthalates, bisphenols, UV blockers, and flame retardants. They are all in this artificial turf mess. Both components have potential to harm health and cause disease. Because of increasing production, low recycling, and long persistence, plastic pollution is increasing.

San Francisco Estuary Institute found microplastic pollution in every part of the Bay at some of the highest levels measured globally. SFEI's study says when wildlife eat microplastics, these tiny bits can block and damage organs and leach potentially harmful chemicals. Microplastics and chemicals can transfer up the food chain.

If you do nothing, Commissioners, microplastic emissions will follow the rise in plastic production, resulting in greater risks of toxic impacts and spreading toxic chemicals. Adopt legally binding measures without further delay. Self-regulation and voluntary measures have failed to reduce microplastic pollution. Whatever you can do to keep microplastic out of our 100 foot of shoreline will be more than a drop in the bucket.

Bill Clark spoke: Good afternoon, Commissioners. Bill Clark here again to offer more perspective from inside SF Marina on the Marina Project.

In my statement to you on September 3 I attempted to describe how the boating community is served by Rec and Park as a marina operator. When it comes to the creation of park and open space opportunities to underserved SF citizens, Rec and Park has an exemplary reputation providing access.

However, the benevolence Rec and Park bestows upon marginalized neighborhoods is nowhere to be found in their approach to marina management and subsequently the MIRP. There is a boating underclass Rec and Park has left out of the project plan altogether, with a blind eye towards the equity inclusion they flaunt for their parks.

Instead, they offer more space for boat owners who can afford the highest rates in the Bay Area; and sprawling half-harbor opportunity for kayakers in a marina where many in the boating community are left out. This doesn't amount to greater public access or an opportunity to grow boating, but in reality shortchanges the boating community.

What would increase boating public access is an expanded network of guest docking for weekend and overnight stays, more day-use docking so that smaller boat owners excluded from the berthing plan are encouraged to visit, an attendant kiosk to manage visitors, and accommodate impromptu arrivals, space for youth sailing, instruction and programs, the availability of touch-and-go docking for temporary stays that is not provided now, et cetera.

The costs to dredge East Harbor for greater use are overblown since most of the contaminated harbor floor soils have already been removed. It is Rec and Park's choosing not to spend project funds to dredge the current four feet closer to eight feet.

It is also Rec and Park choosing not to rehabilitate the fuel dock with exaggerated cost estimates to ward off opposition. The fuel dock should be the centerpiece for a renewed visiting boater experience, state-of-the-art emergency response, and a rejuvenated hub that, without it, would be an egregious diminishing of what gives SF Marina character and a sense of community.

The omission of 15 to 25 foot boats from the project berthing plan is no reason to exclude them from access. In fact, expanding the visiting program would allow them to participate in SF Marina as a base for northern waterfront boating experience as well as area attractions. However, with only one harbor employee attending to weekend guests, a bare minimum of guest docking allocated in the MIRP, a complicated reservation process, no touch and go, and for years now Rec and Park has made it clear that visitor use is not a priority.

The project design follows a similar lack of interest in visitor participation. This is a glaring omission from the MIRP. The Marina Project has been under design review for months now. Yet those of us who have been engaged with the project for the past five years have not been privy to the changes. We had hoped for another round of public comment on design alterations before the final vote.

One more sentence: We would like to think that BCDC has more options than yes or no to approve the permit for the MIRP.

Commissioner Eklund chimed in: I was just going to ask a question of staff: If the BCDC has jurisdiction over the artificial turf that may be impacting the Bay, or is it really the Regional Water Quality Control Board? Is that a question that I could ask?

Chair Wasserman replied: I am going to request that you address that to staff for a future discussion because I do not think it is a simple answer to your question. This is not a yes or no question. Although I will forecast to you that we do not have very much jurisdiction at all.

Commissioner Eklund added: I would like us to do that because this is the second time we have heard it.

Chair Wasserman acknowledged: We will include that one way or another in an upcoming meeting.

Chair Wasserman continued to the Report of the Chair.

4. Report of the Chair. Chair Wasserman stated: That brings us to Item 4, my report.

I am going to start with an apology. If I had known what I am about to say I would have brought a cake. Because today, as Commissioners heard from our Executive Director, September 17 is actually the birthday of BCDC, 61 years ago in 1965.

I will take this moment once again to recognize the vision and the courage and the effort of the four women who really led the effort to start Save the Bay as well as to start BCDC. Four faculty wives who all looked down from the Berkeley Hills and were very distressed by what they saw as unregulated proliferation of filling the Bay, both with junk and prospective housing, and really ignoring the preservation, conservation as we call it, of our wonderful resource, the San Francisco Bay. And their efforts, which I would note were largely ignored by the then male-dominated environmental community, were successful in getting the legislature to do a study first, and then in fact to enact the act that created BCDC.

I would say we have done very well over these years. We have indeed both conserved the Bay and helped and approved development of the Bay so that we have the preservation of this jewel, but we also have the appropriate and necessary development both within the Bay and on its shoreline. So, happy birthday, and we should all take a moment to celebrate.

a. Next Commission Meeting: On slightly more mundane matters, I want to note that the next Commission meeting in two weeks, unlike our previous announcements, will commence at the regular time and not be an all-day meeting. It is a juggling of agendas, which happens frequently. Simply the timing of getting things prepared to present. We do expect at that meeting to have two main agenda items:

- A public hearing and potential vote on the Peninsula Crossing development in Burlingame; and,
- We will have a briefing, not a decision but perhaps a fairly complex and interesting discussion on BCDC's updated jurisdictional determination process based on updated GPS abilities and just a fresh look. This is in particular where our jurisdiction applies in terms of certain relatively inland creeks and inlets from the Bay. We are planning to have a discussion about that. It will affect numerous cities around the Bay.

I would like to ask Commissioner Ahn to report on this morning's EJ Working Group.

b. Environmental Justice Working Group Report:

Commissioner Ahn reported the following: The EJ Working Group this meeting involved two staff presentations and then a general discussion on the direction of the Environmental Justice Commissioner Working Group. So, the two staff presentations were Dalila Adofo presenting on a program overview of the Shoreline Leadership Academy Program, which both is in San Francisco and Contra Costa County. So, there was reflections from partners of the program and participant evaluations, which were all overwhelmingly positive.

Dalila will be providing a brief summary of that program to the full Commission meeting today as well as part of the sea level rise briefing.

The second presentation was from Todd Hallenbeck presenting on the latest updates to the Community Vulnerability tool and the CBO Directory. The Working Group also discussed the impacts of that Community Vulnerability tool, how it can perhaps shape state-level discussions around mapping and our future outreach as well.

So, with that, the Commissioner Working Group has also discussed with the AJ Advisors about changing the cadence of the meetings from bi-monthly to quarterly, and then we will be identifying one to three priorities to work on, on an annual timeline.

Chair Wasserman acknowledged: Thank you. Any questions? I do not see any.

c. NOAA Public Hearing: Chair Wasserman continued: I want to belatedly report since I was not here at the last Commission meeting on the NOAA public hearing which occurred at the end of August. I want to spend a couple of minutes giving you my impression of what I thought was a very important and successful public hearing, although its success will be judged in action.

This, of course, was in response, a public hearing called by NOAA pursuant to the Secretary of Commerce's direction to reopen our NOAA Section 312 review. The formal review, as you may recall, had been completed in 2024. There was a draft report issued in 2025. It said everything was going fine. It was never finalized.

And it was clear both on the face of the Secretary's letter and certainly based on the comments of over 250 people who testified at this public hearing - and on top of that were I do not know the number but it was I believe at least that many who participated in two virtual meetings, and I think there were well over 3,000 comments submitted in total.

That this is simply one more attempt by the current federal administration to stop California's effort to protect our environment, the specifics in his letter have almost nothing to do with BCDC. They are mostly focused on the California Coastal Commission, and they involved issues of space exploration, oil drilling off the coast, and infrastructure and pipelines.

For the public hearing there were no speakers supporting the Secretary's comment. I have been told that there were a few speakers in the virtual presentation, primarily I believe, from some oil companies.

The hearing was sad in one way. I have to tell you, the two NOAA employees, senior employees who were conducting the hearing as they were required to do, had to hear this barrage of complaints, which were not directed at them. But they did their duty. They did it well. The process will continue.

There will be a formal report. We do not know what it will do. At the extreme end NOAA could decide to suspend federal funding from NOAA for the three coastal zone management agencies. That is the California Coastal Commission, the California Conservancy, and BCDC. It would not, at its worst, have terrible effects on us. It would reduce us, I think, in the neighborhood of $3 million. It would have a bigger effect on the Coastal Commission. I believe that if that result were taken, it would be unlawful, and we will, if that happens, evaluate what our response should be. But the opposition to the Secretary's letter was well done, well marshaled, well presented. That is not to say it will have any effect on the actions of this administration.

d. Gubernatorial Transition: I am switching subjects now. We will have more details on this in November, but the Natural Resources Agency is beginning to create a transition document for the incoming Governor. We are participating with them along with the other agencies within the Natural Resources Agency and we will keep you informed as that is being developed.

That concludes my remarks, and I turn it over to Greg Sharff for the Executive Director's remarks.

5. Report of the Executive Director. On behalf of the Executive Director, General Counsel Scharff reported: Thank you, Chair Wasserman.

Today is not only BCDC's birthday; it is actually the birthday of the Constitution of the United States, so we are in good company in birthdays. On this day in 1787, 39 delegates signed the completed United States Constitution at Independence Hall in Philadelphia, bringing the Constitutional Convention to a close.

That is why September 17 is observed as Constitution Day and Citizenship Day, commemorating the signing of the Constitution. The observance was established by federal law and is officially recognized here in California.

The Constitution created a framework for navigating profound differences while holding the nation together. Later today, we will shift from that historic effort to prevent institutional collisions to a very literal Bay Area concern, protecting our bridges from vessel allisions.

The Enforcement Team has signed the contract for BCDC's Regional ADV consultant that you approved, which is now moving through the DGS approval process. We expect approval in the next 60 days. As we discussed at the last Commission meeting, we are very excited to be moving forward with a regional ADV program. Next week, staff will also lead a presentation at the Restore America's Estuaries Conference highlighting BCDC's work on ADVs and unauthorized anchor-outs in the San Francisco Bay.

On the Compliance side, the team has reduced the number of permit deliverables requiring attention from more than 400 to just over 200. So, congratulations to the Compliance team. Staff are also preparing their first major proactive compliance workshop for Oyster Point permit holders, focused on maintenance responsibilities and BCDC permit requirements.

Staff also presented the Shoreline Plants Landscape Guide to the Design Review Board on September 14th, kicking off the process of updating the Guide. Staff has also launched a public survey, and the results will help guide development of this updated document. We invite all Commissioners to take the survey and share it widely with your networks. Please watch for an email containing the survey link.

Last Friday, Commissioners, Alternates, and interested parties received the Staff Report and Preliminary Recommendation for Bay Plan Amendment Number 1-26. The amendment proposes changes to the San Francisco Bay Plan addressing the beneficial reuse of sediment and soil for wetland restoration and sea level rise adaptation.

The Commission voted to initiate the amendment in May, but the proposed changes are the product of a three-year stakeholder engagement process.

Friday's mailing opened the public comment period. Members of the public may submit comments by email to publiccomment@bcdc.ca.gov or provide oral comments at the public hearing during the Commission's October 15th meeting. The hearing will be accessible both by Zoom and in person at the Metro Center, and the Amendment will then return to the Commission for a vote at a future meeting, likely in November or December.

With that, Chair Wasserman, I am happy to answer any questions.

Chair Wasserman asked: Any Commissioners have questions for Greg? I see none.

6. Consent Calendar

a. Approval of Minutes for September 3, 2026 Meeting

b. Commission Consideration of a Contract to Provide Communications Support

c. Commission Consideration of a Contract to Undertake an Exploratory Sand Ecology Study with San Jose State University and Moss Landing Marine Lab

Chair Wasserman reviewed the items on the Consent Calendar and called for public comment.

(No members of the public addressed the Commission.)

Chair Wasserman asked: Are there any Commissioners who would like to ask any questions or comments on the Consent Calendar.

Vice Chair Eisen was recognized: When I noticed that we were approving a couple more contracts I asked if it might be possible for staff to put together a summary of all of the many contracts that we were involved in, who the contracting parties were, the amount, and importantly I think, which of our strategic goals the contract was intended to support. I am very pleased that staff immediately responded. Greg immediately responded that they would put that kind of a summary together for us, which I think will be very useful. Thank you, Greg.

Chair Wasserman asked for a motion and a second to adopt the Consent Calendar.

MOTION: Commissioner Cox moved approval of the Consent Calendar, seconded by Commissioner Eklund.

VOTE: The motion carried with a vote of 18-0-0 with Commissioners Ahn, Cox, Eklund, Gilmore, Gioia, Gonzalez, Hacker, Hasz, Kimball, Kishimoto, Mashburn, Nelson, Nguyen, Pemberton, Ramos, M. Tam, Vice Chair Eisen and Chair Wasserman voting, "YES", no "NO" votes, and no "ABSTAIN" votes.

7. Commission Consideration of Administrative Matters.

Chair Wasserman asked if there were any questions for Regulatory Director Harriet Ross regarding the Administrative Listing.

(No members of the public addressed the Commission.)

(No questions were posed to Ms. Ross.)

8. Briefing on Bridge Safety from Vessel Strikes. Chair Wasserman announced:

Item 8 is our briefing on bridge safety from vessel strikes. The Commission will receive a briefing from BCDC staff and Metropolitan Transportation Commission staff on regional efforts to evaluate risk at Bay Area bridges from vessel strikes and the work currently underway to improve safety. BCDC staff member Cody Aichele-Rothman will begin the discussion.

Coastal Planner Aichele-Rothman addressed the Commission: Thank you, Chair Wasserman and Commissioners. My name is Cody Aichele-Rothman, and I am a Coastal Planner and the Oil Spill Response Contact for BCDC.

I am here to introduce a briefing on bridge safety. This is an informational briefing, and it is not associated with any proposed project that would come to the Commission for a permit in the near term. With this and the following presentation we aim to give an update on the progress of regional coordination to reduce risk, and the outcomes of the Caltrans study on the Bay Area bridges.

BCDC receives funding from the California Department of Fish and Wildlife Office of Oil Spill Prevention and Response to partner with a number of multi-jurisdictional committees and work groups at the local, state, and federal level related to oil spill and navigational safety.

BCDC staff is trained and prepared to assist in the event of a major oil spill by regularly participating in drills and exercises around the region. In particular for today's presentation is BCDC's involvement with the San Francisco Bay Harbor Safety Committee.

The San Francisco Bay Harbor Safety Committee is a state-mandated multi-agency organization with leadership by the San Francisco Marine Exchange to promote and plan for safe vessel navigation across the San Francisco Bay and into the Delta to the ports at Stockton and Sacramento.

The Bay is a busy place with passenger ferries, tugs, ships, small, and large private and public vessels moving around daily. Tens of thousands of vessel transits per year.

BCDC is a voting member of the Harbor Safety Committee and works with the different entities on a number of subcommittees and work groups, as well as helping to organize the annual updates to the Harbor Safety Plan. Members of the Harbor Safety Committee include ferry operators, ports, tugs, bar pilots, commercial and recreational industry representatives, and local, state, and federal partners.

Following the tragic bridge allision and collapse in Baltimore of 2024, bridges, ports, and the maritime communities around the country started to ask, could that happen here? Risk assessments and studies occurred around the country.

Here in the Bay Area, BATA and MTC funded a *Ports and Waterways Safety Assessment (PAWSA)* as part of an IALA Waterways Risk Assessment Program. This included a three-day workshop last April, which I attended as the representative for BCDC, and the report was released a couple of months later. This was not the only study done here in the Bay Area in the past year, and more studies are also planned with other agencies and entities.

With this momentum and insight, BCDC prompted the San Francisco Harbor Safety Committee to create a new work group to study the PAWSA and possibly other relevant reports to see where safety could be strengthened throughout the complex Bay system.

This new group, the Maritime Evaluation for Risk Insights and Trends, or MERIT, was launched in March and has met a few times since. Chaired by Captain Dave Corbett of the Bar Pilots, the membership includes many of the folks who participated in the PAWSA workshop, who are and are not members of the Harbor Safety Committee. We hope to deep dive into the studies and find collaborative, action-oriented solutions to address the myriad of risks and challenges we face in our Bay.

I want to thank you for your time and attention. Now I would like to introduce David Man of the Bay Area Toll Authority and MTC, who will give a more detailed update on bridge safety.

Afterward, I am available for any questions, as well as members of some of the groups that I have discussed such as Scott Humphrey who is the Chair of the San Francisco Harbor Safety Committee. Captain David Corbett, Chair of the Bar Pilots and Chair of the MERIT Work Group, and Muthanna Omran from Caltrans.

Mr. Man spoke: Good afternoon. I guess it is happy birthday to BCDC. Again, I am David Man. I am from the Metropolitan Transportation Commission; but also, a separate entity, a related entity, the Bay Area Toll Authority. I am a Section Director and one of the program areas that we are responsible for are the seven state-owned toll bridges. So, just before I begin, I want to just appreciate Caltrans Director Nguyen being here as well joining us. We look forward to having a great conversation here today with you.

As I start here, I just want to remind everybody: the Bay Area Toll Authority, or BATA for short, and Caltrans, jointly manage the region's seven toll bridges. And that partnership is very essential because it combines Caltrans's engineering and operational expertise with the Toll Authority's funding oversight role to ensure that the critical infrastructure in the region continues to connect and support the Bay Area.

And of course, as Cody mentioned today, we have an update on the progress we have made to better understand the risks to some of our toll bridges from vessel strikes. And I just want to remind everybody this is another strong example of the partnership between the state and the Toll Authority in working on these toll bridges.

I do want to note that a similar update was provided to the Bay Area Toll Authority Oversight Committee in May of this year.

As was covered previously, a little over two years ago on actually March 24, 2024, the Dali struck the Francis Scott Key Bridge causing it to collapse. Unfortunately, lives were lost, goods movement was stalled, and many of the bridges over waterways were put in the spotlight, including those here in the region.

As with major accidents, the National Transportation Safety Board or NTSB launched a thorough investigation that eventually led to recommendations to the public and private sectors, including bridge owners like Caltrans, which is the focus of today's update.

I do want to note as part of this discussion you may hear it slipped, there is the word collision and there is the word allision. The word allision is actually the technical definition that describes an impact of a vessel with a fixed or stationary object, such as such as a dock, a pier, or an anchored vessel.

So as was mentioned before, one of the key recommendations that came out when NTSB released its initial report, NTSB found some bridge owners were not aware of the risk of collapse due to vessel allision. Ultimately, they identified 68 bridges nationwide owned by 30 different owners that should be further evaluated.

The criteria established by the NTSB in consultation with the Federal Highway Administration said these bridges designed before 1991 when the Vessel Collision Design Guidance was released by the American Association of State Highway Transportation Officials.

Second, bridge owners had not yet completed bridge strike assessments using the current guidelines; meaning owners may not have been fully aware of the risk.

Third, bridges must also have large ocean-going vessels trafficking under them.

The NTSB ultimately recommends identified bridge owners to complete the risk evaluation, and if necessary, start developing Risk Reduction Plans.

Zooming into California, seven bridges were ultimately identified by NTSB. Five of the seven are state-owned toll bridges, for which BATA has financial responsibility for. You can see them on the screen. It is the Richmond-San Rafael Bridge, the Carquinez Bridge, the Benicia-Martinez Bridge, the San Mateo-Hayward Bridge, and the Antioch Bridge.

I do want to note that the Benicia-Martinez spans, there's a couple spans at the Benicia-Martinez Bridge and also the Carquinez Bridge, and those are actually newer. So, the bridges that are in question are the ones where on the eastbound for Carquinez Bridge, and also the southbound for the Benicia-Martinez Bridge.

I also want to highlight that the Golden Bay Bridge was also identified, but that is not under the purview of the Bay Area Toll Authority or Caltrans.

And then down in San Diego, the Coronado Bridge was also identified as a bridge of interest.

The NTSB also acknowledged the Bay Bridge west span had ongoing design work related to the fender project and was not subject to the inquiry.

After receiving the recommendations from NTSB, we got to work with Caltrans, with Caltrans taking the lead on the analysis with support from the Bay Area Toll Authority team.

Summarizing the NTSB recommended actions and progress by Caltrans and BATA that you see here.

One of the recommendations was to complete the analysis of the identified bridges, so you can see that check mark there.

Secondly, develop comprehensive Risk Reduction Plans.

And three, evaluate the need for a motorist warning system.

To the to the second bullet there, developing a Risk Reduction Plan. That is currently in progress by the agencies and working in consultation with the maritime stakeholders.

And the third bullet there, the evaluate the need for motorist warning systems. I do want to provide a little bit more detail on that.

As the investigation by NTSB unfolded and we got the initial recommendation in 2025, the NTSB as part of their final report that was released in late 2026, issued an additional finding and recommendation for bridge owners. NTSB also recommended bridge owners to evaluate the need for a motorist warning system to protect the traveling public from entering onto a bridge at risk from an imminent vessel strike. It was recognized that the immediate actions taken by the public agencies that night in Maryland to stop traffic from entering the bridge when it was found that the Dali was noticeably off course, saved lives.

I do want to highlight that Caltrans is making good progress in evaluating these needs, and they have also started development of projects at the affected bridges and updating their emergency response procedures.

As far as the risk, just to provide a little context and summarize how we measure the risk of bridge collapse. At a very high level it comes down to a detailed analysis that estimates the likelihood that a vessel could strike a bridge and cause collapse in any given year. The calculation is based on three general factors.

First, the characteristics of vessel traffic on the waterway, including the speed, size, type, and number of ships.

There in the middle, the waterway environment itself, such as channel geometry, location of bridge piers, and water depth.

And third, it is also about the bridge, bridge defense. It is the bridge geometry, span length, structure capacity, and any existing protection systems on the bridges, like fenders.

By the numbers, what do the risk calculations mean, and what is the recommended risk threshold under today's guidance?

For critical Bay Area toll bridges, if this was a newly designed and constructed bridge, the risk threshold for a bridge collapse due to a ship strike should be no more than 0.01% per year, or a 1 in 10,000 chance. Or put in another way, something that should not occur more than once every 10,000 years.

As I noted earlier, most of the toll bridges that were highlighted on the screen predate most of the recent design guidelines and also the maritime environment has changed over the years.

While three of the five bridges, the Richmond-San Rafael Bridge, the Carquinez Bridge, and Benicia Bridge, were calculated to not be within this newer risk threshold.

As shown on the table on the right, the risk we believe is still relatively small as the probability of such an event is very low. I do want to remind everybody the results of the analysis do not mean the bridges are unsafe. We do recognize that this is one of actually several risks associated with the toll bridges that we need to manage through monitoring and, when appropriate, action.

I do want to highlight the Toll Authority actually adopted its first ever Toll Bridge Asset Management Plan earlier this year. This plan provided us a framework to manage the different types of risks, like vessel strikes, and help guide our investments to keep the bridges in a state of good repair for decades to come. We will be updating our Asset Management Plan accordingly as new strategies and risks develop. But it is something that I want to highlight that is very important to this conversation.

Also, I want to highlight that we are not alone. There are other bridges around the U.S. with similar circumstances. The Bay Area Toll Authority and Caltrans staff have been active in our engagements with bridge owners across the U.S. so that we all can collectively learn together and understand the risks that we are dealing with.

Recognizing the likely need to better understand the maritime domain, as we mentioned the bridges are one aspect of what is going on in the Bay, BATA funded the Ports and Waterways Safety Assessment in 2025. This work really actually gave us an early head start with the risk assessment process and established a framework for further development of risk reduction strategies. I do want to highlight and thank the Harbor Safety Committee for organizing this assessment and their continuous support of our work together. And really bringing together these multi-dimensional stakeholders, right, bringing land and sea together.

I also want to highlight on the second bullet point from the top, Caltrans's motorist warning system evaluation is underway. Project planning is moving forward, which is very exciting news.

The third bullet there is in terms of what has been completed. The risk evaluation has been completed for all five bridges. The top three bullets that you see are work that has been completed.

As far as what we want to do moving forward.

We recognize that this Bay infrastructure domain is very complicated.

We do want to continue to review industry best practices, consult with experts from across the nation.

And most importantly, we do want to partner with other domain operators, including the U.S. Coast Guard, the Bar Pilots as has been mentioned, and the California Highway Patrol for the Emergency Response Plan.

We also plan to continue to look at potential upgrades to navigational aids such as radar, lights, and sensors for our bridges to alert boats and ships of where the bridges are.

As well as we are going to continue, and this is part of that total asset management work that we are doing, we are going to continue to develop and implement a comprehensive Risk Reduction Plan for our toll bridges where the vessel strikes are one of the areas that we are concerned about.

Of course, in the long term, as we gather more information and better understand the relationships between vessels and bridges, we will continue to enhance protection for the bridges as appropriate.

As I highlighted in the previous slide, risk reduction is really an ongoing process, and some strategies could take more time as we better understand that land and sea interface - and also importantly, the trade-offs.

I want to highlight the complexity, the factors, and constraints that we must consider in the near-term and long-term actions, and some of those are what you see on the screen.

And just at the at the high level the waterway, the San Francisco Bay here in front of BCDC, is an important resource. We need to recognize the potential impacts to the environment, and also potentially sea level rise as well.

Also, we have to recognize that ships may continue to get bigger, and there could be more of them in support of our economy.

And also, we have to recognize ships do need to get to ports. We cannot simply just reroute them around the bridges.

Another area that we are interested in is bridge defense. It is possible to upgrade existing bridge defenses, such as fenders, to full protection for the larger ships today. That is something that we need to think about. But I do want to highlight that there are environmental impacts to that approach, especially to the Bay and to navigation. The bridge itself structurally will also need to be very carefully evaluated for this.

As I mentioned earlier, asset management really drives our approach, and we need to look at all the risks associated with the toll bridges systematically across the board and understand their implications together. So that is where we want to take a very comprehensive approach to safeguarding our toll bridges.

I do want to point out something that is really great for this region. Something that I have learned personally, and I think a lot of us have learned here in San Francisco Bay, being someone that has been working on highways for most of my career.

Due to its complexity and the high volumes of ships in the San Francisco Bay it really benefits from a very strong interagency coordination and well-established maritime safety practices that help protect both people, infrastructure, including our bridges. There is an extensive and comprehensive risk reduction already in place in the Bay. Prevention is happening on a daily basis. There is situation awareness and coordinated operations of vessel traffic that greatly reduces the probability of an issue.

And just starting on the left and it has been highlighted in the past, we recognize the San Francisco Bar Pilots and the U.S. Coast Guard have the responsibility to oversee large ships moving in and out of the Bay, there is also tugs that escort certain tankers.

On the bridges Caltrans, the state actively maintains navigational aids on the bridges. And each of the bridges has fenders.

And lastly, when responding to an issue, we do have a very robust framework in place to respond in case there is an incident.

And of course, helping everyone communicate on the water. The San Francisco Bay is actually home to 1 of 12 regions with Vessel Traffic Service. It is really the maritime version of air traffic control. And the VTS is operated by the U.S. Coast Guard out of the Vessel Traffic Center located on Yerba Buena Island.

And lastly as highlighted before, and this is something that we have learned greatly, that the Bay has a Harbor Safety Plan developed by the Harbor Safety Committee. And recognizing the need for a holistic approach to risk management, the Bay Area Toll Authority and Caltrans have really strengthened their relationship with the Harbor Safety Committee and we much appreciate them bringing us into the conversation to participate and learn about the marine environment.

So just in closing I do want to note that we do have an ongoing project on the San Francisco-Oakland Bay Bridge on the west span. It had an ongoing project. And this is a project that is being led by Caltrans. And it has actually completed its design, and it is actually going to construction hopefully later this year or early into 2027. And this project is actually replacing the existing wooden fenders in kind with a new rubber fender material technology that will improve energy absorption and also simplify maintenance being in the marine environment. We expect Caltrans to finish construction in approximately one year.

In closing, as progress is made, we will keep the Bay Area Toll Authority, state agencies, and BCDC updated over the progress. But thank you for the time for just providing an information item. Thank you. Happy to take questions with the team.

Chair Wasserman acknowledged: Thank you. We are going to go to public comment in a moment, but I want to set a context first. This is a very important topic. But like many topics that we discuss and that our jurisdiction touches on, we have an important role in this, and Cody and the other speaker have talked about those. We do participate in the Harbor Safety Committee. We have very little power or authority, and I think that is important for everybody to know.

Educating people about the risk, educating people about what is being done about it, is certainly an important action for us to take as we are doing here. But there are some significant limits to the extent at which we can affect any of this.

I know that there are some Commissioners who want to speak, but I am going to go to the public first because I think there is some important information that we may get from the public as well.

(No members of the public addressed the Commission.)

Chair Wasserman continued: I do want to start with one quick question. Go back to slide 4, please. On the actions that are going to be taken that are underway by Caltrans, what is the rough time frame for those? It is not that one then, it must be the one before. Or after, try the one after. Yes.

Mr. Man replied: So, first action, risk evaluation is complete, it has been submitted to the federal government. They are still reviewing it; we are maybe waiting for their feedback.

Chair Wasserman asked: Do we have any guesstimate on when they will be done?

Mr. Man continued: Not yet. From the Fed side, of course. However, as far as developing the comprehensive Risk Reduction Plan, I think it is going to be done in stages because we are going to learn more as we do more research. I anticipate some aspects of it being developed over the next I would say near term, one to two years. And then further on as we better understand more factors, we may have additional updates to that plan as well. We are trying to do it in stages and deliver the most effective strategies in the near term.

I do want to highlight most importantly too. There is a lot of work that is being done with the MERIT group that was mentioned, through the Harbor Safety Committee. The Harbor Safety Committee is really helping us better understand how boats, operators, ships, and vessels operate in the Bay.

That understanding and the potential areas of, let's say, efficiencies/improvements in the Bay operations, actually greatly help reduce the risk to the bridges as well. It is really, as I mentioned, a holistic approach. It is not something that is fully addressed by improvements to the bridges.

I think there's opportunities in terms of interagency coordination, maybe technology, and also potentially any future upgrades to bridge defenses.

I will also highlight that third bullet there, to evaluate the need for a motorist warning system. As I mentioned, Caltrans is making great progress on that project. We actually did, and this is in the public sphere, we did respond to NTSB. We hope to start construction of maybe the first system by around the end of 2028.

Chair Wasserman acknowledged: Thank you very much. I know that there are some Commissioners who wanted to speak on this and I am going to start with Commissioner Hacker.

Commissioner Hacker spoke: Commissioner Gunter could not be here today; I am his Alternate. He prepared a letter which he asked me to read.

Chair Wasserman, fellow Commissioners and staff: I know that all of us were astonished to watch the video of a cargo vessel knocking down the Francis Scott Key Bridge in Baltimore.

In addition, I expect all of you were as happy as I was to know that knowledgeable stakeholders in our community and the National Transportation Safety Board were considering whether such an event could occur in San Francisco Bay, and what we can do to reduce the risk of such an event.

Part of the reason a potential accident resonated deeply with me was my extensive experience with the aftermath of a major ship accident through my service as the Assistant Chief Scientist for the Exxon Valdez Oil Spill Trustee Council from 1994 to 2002.

Consequently, I decided to read the *Ports and Waterways Safety Assessment*, which documented the proceedings of a recent well-attended workshop that reviewed the issue of ship-bridge allisions. Participants included the San Francisco Bar Pilots, the Board of Pilot Commissioners, California Department of Transportation, the San Francisco Harbor Committee, Port and shipping Representatives, and many others, including BCDC.

Commissioner Gunther continues:

It seemed to me these were the right people to be on the job. Certainly, they know more about these issues than do I.

The assessment includes some key findings of fact about conditions in the San Francisco Bay Area. Two of these findings stood out to me immediately:

1. "Loss of steering and propulsion incidents continue to be prevalent and often happen around bridges and other critical infrastructure.

And 2. Vessel congestion forces deep draft mariners to make high-risk decisions with limited safe options and little room for error."

From these facts I conclude there is a risk of ship-bridge allisions in the Bay Area.

The assessment also makes clear that our Vessel Traffic System, VTS, is antiquated, and much of our safety infrastructure was designed for a time when ships were smaller and slower moving. Other complexities contribute to heightening the risk, including language barriers between vessel operators and VTS, poor maintenance of some vessels, fog and other natural phenomena, and the plethora of small craft on the water, particularly in the central Bay.

I am deeply gratified that so many people are presently working to reduce the risk of a major ship-bridge allision in the Bay. While this work is ongoing, I would like the experts in our region to determine if there are interim measures we could put in place to enhance public safety.

In particular, I would like to note that since the time of the Exxon Valdez, tug escorts are required for tankers carrying crude oil in San Francisco Bay. It seems to me that a commonsense precaution to reduce the risk of a ship-bridge allision would be to also require tug escorts for the enormous container ships as they approach and pass under the Bay Bridge and the Richmond Bridge.

I am sorry I am unable to attend today's hearing. I have asked Alexis to request that staff be directed to report back to the Commission on a reasonable time frame, no longer than six months, regarding the status of risk reduction efforts and the feasibility of instituting tug escorts or other reasonable interim risk reduction measures.

That is from Commissioner Gunther. Thank you.

Commissioner Gioia chimed in: Thank you. So, just a couple thoughts. I know in addition to collision affecting bridge infrastructure, right, there are collisions that impact the Bay. And I think back on the Cosco Busan incident when the ship struck the Bay Bridge and caused a fuel spill in the Bay. There are those issues to be aware of as well, right? How, in addition to damage to the bridge, how some of these collisions that we do not want to happen affect the Bay itself. It does not sound like that was specifically addressed, but I think that is an area of concern.

Second, did I miss, you did not list the San Francisco-Oakland Bay Bridge on there as exceeding the threshold?

Mr. Man explained: As I noted before, that was not at the request from the NTSB at the time, so we focused on those five bridges at the time.

Commissioner Gioia continued: Because I remember there was a study, this got reported in the news, it came out last year, I think it was from Johns Hopkins, that identified that bridge as the second-most vulnerable bridge in the country to collisions. Remember that study? I just pulled it up, yes.

Mr. Man continued: Thank you for bringing it up. I think that is a study done by the University. I think in respect, as I mentioned, we were taking a holistic approach to the Bay; that would include all the toll bridges. I think as we evolve, we may take a look at the Bay Bridge again, but right now the focus is on the actual work that has been started.

Commissioner Gioia noted: It is just that that study identified this as, I just looked it up, a collision every 22 years, how they call it. So anyway, it was listed as at risk and I am just wondering, were there different metrics that they used to measure that compared to the ones that were used in what you cited?

Mr. Mana answered: I cannot comment on the details of the methodology but I think there would likely be differences in their approach and potentially the data used. I think there is quite a bit of engineering judgment involved with risk analysis.

Commissioner Gioia acknowledged: Just flagging that because that got a lot of press here and it got identified as one of the bridges that are likely to get hit and damaged.

Also, I know we have approved permits for dredging of ports to handle deeper draft container ships. I know that some of that has involved container ships that have come in with new, very tall cranes. I think they have had to navigate coming in at low tide so that they do not hit the bridges, including the Golden Gate Bridge. That is relevant for us, which is important for maritime activity. We are allowing dredging to bring in larger container ships which have bigger cranes. I was just wondering our role there in ensuring. There has not been an accident yet of those big cranes coming in at low tide, but that is another area just to identify our role of ensuring that a port that is bringing in new, more modern, larger equipment, take the precautions so that we do not have a bridge collision. And is that risk going to go up with some areas as we address sea level rise?

Mr. Man responded: I think, Commissioner, I think it is noted. I think the focus of the exercise has been looking at ships hitting the piers. But I think that is something that I would defer comment to for a later session as it does involve a number of other agencies involved in looking at that. I do want to highlight there are what we call air gap sensors on these critical bridges to understand the depth of the height of the bridge relative to the waterway, so that is something that is being monitored.

Commissioner Gioia continued: And finally, the lead on doing this work presumably is Caltrans, at least leading this because they own the bridges? Except Golden Gate Bridge, of course.

Mr. Man answered: Yes, they are state-owned toll bridges. Caltrans is leading the work, and the Bay Area Toll Authority is in support of them.

Commissioner Gioia asked: The Golden Gate Bridge District is?

Mr. Man replied: As I mentioned, they are separate, Commissioner, yes.

Commissioner Gioia noted: Yes, but they are leading, they are involved, they are leading efforts with regard to the Golden Gate Bridge.

Mr. Man agreed: They have, and I think publicly they have responded and provided information of what their analysis is.

Commissioner Gioia replied: Got it. And the reason the Dumbarton Bridge is not on is because of the shallow Bay waters and you do not have large commercial vessels down there, it is going to be smaller ships. You would have smaller vessels that would be affecting that because of the shallowness of the waters.

Mr. Man answered: That is the logic, yes. The focus is on large ocean-going vessels.

Commissioner Gioia stated: It would have lost its way if it was down there and run aground before it ever reaches the Bridge. Okay, thanks.

Commissioner Gonzalez commented: I will keep it simple. Two questions. First, the 1 in 10,000. Is that 1 in 10,000 risk of collapse or strike?

Mr. Man replied: Collapse.

Commissioner Gonzalez acknowledged: Thank you. And then in the modeling, are you also projecting that the changes that are happening, such that ocean-going vessels that are increasingly larger and larger? Did the modeling consider that growth into the future, or is it just based on what exists right now?

Mr. Man stated: I do understand Caltrans did the calculations, but the modeling and the analysis was based on historical AIS data from '24 to '25, so it is not projecting out.

Commissioner Gonzalez acknowledged: Perfect. And the last question, and it is more of a curiosity point because I think you said that you have established your first ever asset management. Is that correct?

Mr. Man replied: Correct.

Commissioner Gonzalez added: Plan.

Mr. Man answered: Yes.

Commissioner Gonzalez continued: Things like the bridge painting for purposes of protecting it, was that not part of a systematized plan or are you talking about more of a specific type of asset management beyond asset maintenance?

Mr. Man noted: Yes, I think I want to recognize that asset management has been at the forefront of the actions of Caltrans and the Toll Authority for many, many years. I want to recognize that we have formally adopted an approach at the end of last year, and that includes all major components of the Bridge and understanding its condition and what we potentially could rehab or repair, and to ensure that they last for their life cycle that we are expecting from these bridges. So yes, it includes paint, the deck itself and the superstructure under it.

Commissioner Cox chimed in: When I saw this staff report I read up about the Francis Scott Key Bridge. And the main reason for its failure was that it is a truss system which is fracture-critical; meaning that if one portion fails, the entire thing fails. And so, in your evaluation of Bay Area bridges, I know that the eastern portion of the Bay Bridge is not, it has redundancy, unlike the Francis Scott Key Bridge. But I was wondering whether you evaluated whether they are fracture critical in their construction?

Mr. Man called on Mr. Omran to answer the question: I will defer to Caltrans on that specific analysis.

Mr. Omran replied: Hello, I am Muthanna Omran; I am a Regional Project Manager in Caltrans District 4.

The answer is somewhat more complex than what you read. The fracture critical is a description of a member of a truss, a steel member basically in tension, and that can happen in many configurations.

Also, the design of the bridge itself, if it is what we call simply supported, then it is not going to have the domino effect that the Francis Scott Key Bridge had. We are lucky we do not have that configuration. But a damage to one span, even a small portion of it, will shut down the bridge. And there is a whole lot of ramifications from that, and we are trying to protect against even the smallest of damages.

Commissioner Cox acknowledged: Thank you. The other thing that was remarkable about the Francis Scott Key Bridge strike is that the word went out at 1:27 a.m. and the traffic was actually stopped within two minutes of the word going out.

I worry, now that we have automated systems on all of our bridges, there are no people actually manning our toll gates to shut down vehicular traffic. So, I am curious about what systems are in place should there be a bridge collision, or an impending bridge collision as in this case, what type of warning system is in place to prevent vehicular traffic from continuing to utilize the bridge?

Mr. Omran explained: The good news is we do have personnel 24/7. They are less at night than they are during the daytime. However, we are boosting that ability by a bridge shutdown system. We have like nine projects being developed right now and that is what David talked about. Construction will start in 2028. And some of those bridges will be early, significantly earlier than that.

Those bridge shutdown systems are semi-automated with a human in the link to verify how real the report is. The current target is to shut down the bridges within five minutes of notification. That notification will come from our partners and the Vessel Traffic Service, and that is the entire coordination that David tried to quantify in a very short time. But it is a large effort.

Commissioner Cox continued: And then my final thing was just a comment which is that hindsight is 20/20, and in looking at the Francis Scott Key issue they realized that they had spent decades studying how to prevent terrorism from shutting down the Bridge, as opposed to strikes. And I was astounded to read that between 1960 and 2015, thousands of barges and ships collided with U.S. bridges.

So, it was great to hear that Caltrans had already commenced this study before the Francis Scott Key incident and was aware of the importance of planning for and preventing strikes and mitigating any damage arising therefrom. Thanks.

Commissioner Nguyen was recognized: First of all, thank you, David, Ben and Muthanna Omran for working closely as representing BATA and Caltrans and working on this very important matter.

Speaking for Caltrans and BATA, we take the NTSB recommendation very seriously to protect lives, to prevent allisions, and to protect the critical bridges that we have in the Bay Area.

As David mentioned, the work has been since March of last year, March of 2025, and we have taken significant steps toward that goal. And we continue to do so closely with BATA and Caltrans, as well as all the other stakeholders that David mentioned.

Luckily, in the Bay Area, we have a very robust system existing already for all ships entering the Bay in terms of the bar pilots and tug escorts.

There is more to be done, as some of the recommendations that we heard today, and I think we will have to continue to work on that. Some of those require significant changes, it could be legislation as well, but that that is part of the comprehensive plan that we are all working toward. So, thank you, David and Muthanna.

Chair Wasserman commented: I have a comment and a request. I want to thank Commissioner Gioia for raising the Bay Bridge issue. I appreciate why it is not part of the study and presentation that you have done. I would argue it needs to be, given the University study, given that it is the most impacted bridge in terms of risk. The ships have to come through the Golden Gate, but the Golden Gate spans are something like 4200 feet apart, whereas the spans for the Bay Bridge are closer to 2300 feet apart. I think that does need to be addressed.

Now, I also at the same time want to recognize it is being addressed because in your presentation, of course, you talked about the new fenders that are being put on one of the spans.

I do not want to put a time limit on it, but I do want to echo Commissioner Gunther's request that this return to us. I am not sure of the time but it is certainly less than a year to get an update on both the progress on the studies that you have described, as well as the Bay Bridge, as well as having a presentation from the Golden Gate Bridge Authority since they are different and you do not have control over that. Unclear whether you would like to or not. So, I would address to staff to bring this back to us in a reasonable period.

Because I think again the public information, the educational value of this is very important. For better or worse I think we at BCDC are a little bit more concerned about public education than some of the other jurisdictional entities, which actually have more authority than we do.

So, with that I thank you very much for the presentation and the information and we will look forward to the next one. Thank you.

9. Briefing Update on Sea Level Rise Adaptation Activities and Bay Adapt Funding and Project Navigator Launch. Chair Wasserman announced: That brings us to Item 9, which is a briefing and update on rising sea level adaptation activities.

We will receive a briefing from BCDC staff on several interrelated sea level rise adaptation initiatives, with a focus on the public release of the Bay Adapt Funding and Project Navigator tool. Additional topics will include progress on the interagency MOU on Sea Level Rise and Flooding, Shoreline Leadership Academies and Regional Shoreline Adaptation Planning. Planning Director Jessica Fain will kick off the discussion.

Planning Director Fain addressed the Commission: Good afternoon, Commissioners. We are moving from one risk to another here. But thank you for this opportunity to share with you some of our recent program highlights regarding BCDC's activities related to sea level rise adaptation. This is a briefing only, no action is required, but we are looking forward to your thoughts and comments.

This is a slide you have seen before, but in case you need reminding, here is what is at risk for approximately 4 feet of sea level rise. These are not small numbers. They represent serious economic, environmental, and quality-of-life impacts for Bay Area residents, even for those who do not live along the shoreline. And of course, the challenge is made even more complex in the fact that it is spread across 9 counties, 42 cities, hundreds of special districts, thousands of properties all around one Bay.

In case 4 feet of sea level rise may seem far off to you, let me put that in perspective. We are currently in an El Niño year, which means that mean sea level along the California coast will temporarily be elevated by roughly a foot above normal mean sea level conditions. If an extreme storm surge event occurs this winter, flooding could reach these levels of impact.

In the Bay Area, there is no shortage of smart practitioners, engaged residents, and willing partners who care deeply about this issue. What is sometimes missing is someone who can bring it all together and help connect the dots, and that is where we think BCDC fits in.

Back in 2021 we brought together the region through the Bay Adapt Joint Platform, a consensus-based strategy with more than 50 signatories all coalescing around one shared approach.

At your last meeting you heard from Ethan Lavine who spoke about BCDC's regulatory improvements, which is furthering this Action 7 on refining and accelerating regulatory improvement processes.

Right after this presentation you are going to hear from the Exploratorium and their Sea Civil Rise Education Program, which is advancing Action 3 to broaden public understanding of climate change science and impacts.

Today in this briefing I am joined by my incredible team. We have a whole group of people here today who are going to be speaking with you, and my colleagues from MTC-ABAG to highlight several other pieces of important work.

First, I am going to report on progress on the interagency MOU on Sea Level Rise and Flooding.

Then Jackie Perrin-Martinez will update us on regional and local shoreline adaptation planning advancing Action 5: Align Local and Regional Plans.

Next, Dalila Adofo will share updates on the two Shoreline Leadership Academies that BCDC recently completed with partners supporting Action 2: Elevate Communities to Lead.

And finally, and certainly last but not least, Cory Copeland, Ujjay Siddharth, and Kate Lyons from MTC-ABAG will unveil the new Bay Adapt Project and Funding Navigator advancing Action 6: Figure Out How to Fund Adaptation.

And I will conclude with some next steps. So, buckle up as we take you on a spin around the Bay Adapt Joint Platform Wheel.

I will start just as an update on the interagency MOU on Sea Level Rise and Flooding.

In summer 2024, the seven Bay Area regional agencies and state agencies with regional focus signed the Flooding and Sea Level Rise Interagency Memorandum of Understanding. That was BCDC, MTC-ABAG which includes the San Francisco Estuary Partnership, the Coastal Conservancy, Caltrans, the Regional Water Board, the Air District, and BARC served as the convener.

This MOU building on many of those concepts in the Joint Platform aims to strengthen and align agency activities in five functional areas around fund management, planning, technical assistance, regulatory alignment, and coordination. It is significant because it takes some of those broad stroke goals and assigns specific agency roles and responsibilities. Notably, it has the buy-in from leadership across all of our agencies, which is no small feat.

Next, under each of the functional areas in the MOU it identifies leads and work areas and lays out ways we will work together across our regional agencies to coordinate.

This is a dense slide, but attached to your meeting package you will find a full report on the Fiscal Year 2025-26 accomplishments of the MOU in its second year. I encourage you to read it. It is very rich in content and details and just shows how much we are doing. I am going to touch on a few of these briefly.

I am going to skip Planning because we are going to go over that in much more detail in the next sessions.

But on Fund Management where SCC is the role, the Coastal Conservancy is the role. Our partners are continuing to secure and leverage state and federal investments needed to address the region's estimated $96 billion adaptation funding need over the coming decades. Ongoing federal funding cuts to support coastal resilience, along with the slow release of the state climate bond funds under Prop 4 have tempered funding availability for projects.

That said, there has been progress. SCC, BCDC, and the Army Corps launched the Shoreline Funding Pathways Project to connect potential adaptation projects and potential federal funding.

SCC and BCDC also worked together to host a very well-attended funding workshop last spring.

With SCC in the lead, agencies have also secured federal funding during this time period, including $16 million in Army Corps funds for beneficial reuse projects, about $36 million in U.S. EPA funding and significant SFBRA and Prop 4 climate bond investments.

SCC also successfully lobbied for the release of $70 million in federal disaster funds to address winter 2025 storm damage within the San Francisco Bay Refuge Complex.

And MTC-ABAG accomplished one of its top federal advocacy priorities for 2026 with the introduction of the ADAPT Act by North Bay U.S. representatives John Garamendi and Mike Thompson, which, if enacted, would unlock $10 billion in federal funding for transportation resilience.

In terms of Technical Assistance, last year BARC compiled a really great inventory of all of our agency's technical assistance services. This past summer, the Bay Area Climate Adaptation Network (BayCAN) took it, added to it, and launched a public-facing online library, including Librarian Services, a real person you can call.

RTA work on the RSAP has really taken off this year; you will hear more about that.

But in addition, MTC, Caltrans, SCC, SFEP, and the Water Board have provided a lot of direct support on a range of activities, including Resilient Highway 37, Highway 101 in Marin, Regionally Advancing Living Shorelines, the Emeryville Crescent Regional Shoreline Adaptation Plan, Hayward Shoreline planning activities including the First Mile Horizontal Levee, the Palo Alto Horizontal Levee, and the San Francisco Waterfront Resilience Program, respectively.

In terms of Regulatory Alignment, the BRRIT, the Bay Restoration Regulatory Integration Team, fully permitted seven projects, and one project was completed this year.

In addition, multiple agencies worked, including BCDC, on new regulations, guidance, and policies to help simplify, align permitting requirements and regulations.

The Water Board also approved the last three long-term flood protection plans for 19 Bayfront ocean and oceanfront landfills and 8 industrial facilities, which address sea level rise, groundwater rise, and contamination.

The BARC Governing Board did not convene in Fiscal Year 2025-26. However, MOU partners continue to collaborate across a variety of standing meetings and project and program-specific issues.

BCDC's Bay Adapt Implementation Coordinating Group, our leadership group for Bay Adapt, continue to meet quarterly, bringing a wide range of partners and collaborators together to identify and help solve regional barriers.

Lastly, I would just like to give a shout out to Josh Bradt over there. Josh, formerly with BARC, continues to provide really critical coordination support for this interagency work from his new position at MTC-ABAG. Coordination does not just happen by accident, and we are really grateful for this ongoing support. So, with that I would like to turn it over to Jackie.

Climate Adaptation Planning Manager Perrin-Martinez spoke: Great, thank you, Jessica; and good afternoon, Commissioners.

I am going to speak a little bit about some updates on our Regional Shoreline Adaptation Plan and the planning progress that we have been seeing in the region.

For those who are less familiar with the RSAP here is a very quick refresher. The Regional Shoreline Adaptation Plan is what we acronym as RSAP.

BCDC's Commission adopted the RSAP in December 2024, which contains the guidelines that local governments must follow when they develop sea level rise adaptation plans. There are 51 jurisdictions in the Bay Area required to create these plans, and SB 272 mandates that these plans be completed by 2034.

A main draw in the SB 272 legislation is that any projects identified within approved plans are then prioritized for state funding.

Today I want to give you a snapshot of where we are. While local governments have until 2034 to create these plans, we are actually seeing a lot of really exciting movement quite early on, so I think this is a really fantastic sign of the work that folks around the region are doing.

This image on the right is from our jurisdictional Plan Tracker. This is a public online resource that anybody can access, and they can see which local governments have formally initiated a plan with us. This Tracker includes links to notices, which provide a lot more information about jurisdictions, a part of the plan, a little bit of detail, and also links to websites where they can learn more.

Eight plans have currently initiated with us so far. What this means is that we have met with them, they have shared with us how they intend to develop a comprehensive plan, and both us and the local government have put out a notice on our respective sites, really to ensure that communities can be aware and get involved in those planning processes.

These 8 plans include 12 jurisdictions, 11 of which are required to create a plan, and this includes over 20% of all local governments that are required by SB 272 to do this work.

Since the last update that you all heard in May, Tiburon has also now initiated.

Some of you may be wondering, well, what about all the other local governments? Are they also getting started? And the answer is largely yes. Thanks in large part to the Ocean Protection Council's SB 1 Grant Program, which has funded nearly every one of these plans, there are a large number of planning processes on the horizon. This slide includes planning efforts that have been awarded SB 1 Grant funding. This includes 9 additional upcoming plans that would, once initiated, bring our total number of required jurisdictions who are engaging in sea level rise adaptation planning to over 60% of the region.

Additionally, as we have mentioned before, our team is in contact with just about every single city and county in the region. We continue to build relationships with cities and counties and provide support on how they can get started on their planning efforts.

Even beyond this list there are even more cities and counties that are also making progress forward. They have not yet gotten to the point of having SB 1 approved funding, which is why they are not on this list. But we are in active conversations with many jurisdictions on how they would like to best proceed.

What are we learning? Here is just a really brief. There is a lot of work we are doing. You have a lot of different topics to cover today so this will be brief but there is a lot more to share.

So far, we are seeing a lot of plans that have initiated are currently single jurisdictional plans. Though I do want to make clear that even single jurisdiction plans are required to demonstrate coordination with their neighbors.

As we look ahead at the plans on the horizon, we see that most of those are multi-jurisdictional. The take that I have here is that doing this multi-jurisdictional planning work takes a lot more time to begin and get coordinated and I think that is why we are seeing them come in this second major tranche of plans.

We are also seeing that the entities that are organizing these plans can look quite different across the region, which I think reflects the diversity of organizations in our region.

For example, in the Solano Countywide Plan, which is a multi-jurisdictional planning effort, the actual lead entity there is the Fairfield-Suisun Sewer District. They are managing the process and supporting the County and bringing along the cities.

In San Mateo County we are seeing OneShoreline play a really significant and important role in helping to organize efforts across cities and with the County.

In the East Bay we are also seeing the San Francisco Estuary Partnership, or SFEP, working to support a coordinated planning effort. To me, this really speaks to the importance and need of leadership in multi-jurisdictional planning; and how cities are not inherently set up to do this kind of cross-jurisdictional work on their own and that it is really inspiring to see the roles in leadership being played by different organizations.

Lastly, I just want to reiterate the success, the early success of a new technical assistance offering that we have called the Peer Learning Community. Over 50 participants of local governments and their consultants came together for our first meeting back in August and we heard a lot of interest from local governments wanting to learn more from one another. We heard from them that they want these learning communities to be spaces where they can really share practical support, have candid conversations about what is working well and what is not, and really remain flexible and adaptable to make sure that this meeting space meets their needs and their interests as those change. Our next meeting with this group is scheduled for October and so we are very excited to continue the conversation.

With that I will now turn it over to Dalila to share a little bit more about the work she has been doing.

Climate Equity and Community Outreach Manager Adofo presented the following: Good afternoon, Commissioners. The Environmental Justice Team conducted two Shoreline Leadership Academies in partnership with community-based organizations, nonprofits, local governments, and state agencies, between last year and this year.

The goal of the program was to connect people from diverse backgrounds who were interested in their city and county's shoreline. To connect them to each other, to experts in the field, and to educate the participants on local and regional solution-based efforts around sea level rise, as well as develop their existing leadership skills and start the participants on a journey of engaging and driving their local shoreline planning and adaptation plans.

Each Academy ran for six months, and each participant was tasked with the scoping out and creating a final project that used the knowledge that they gained from the Academy to put it into practice.

We also thank the National Oceanic and Atmospheric Administration for granting BCDC funding for this program. It not only funded the EJ Team's staff time, but also time for our partners, guest speakers, and provided the ability to provide stipends and travel accommodations for our participants, which allowed them to participate fully.

We also thank Exploratorium for being the program's administrative manager and for them giving us the ability to provide food and distribute those stipends.

The Port of San Francisco for their partnership with the San Francisco Academy.

And thank you, staff from Contra Costa County, Delta Stewardship Council, Contra Costa Resource Conservation District, and Watershed Project, for lending your expertise and ties to community to developing the Contra Costa County Shoreline Leadership Academy.

The curriculum design was aligned very much with the Regional Shoreline Adaptation Plan that Jackie, my colleague, just spoke on.

The eight modules of the RSAP were used as themes for each session to follow. The design was also for virtual learning and in-person experiences to not only cover all learning styles, but to increase the digestion of the material, and also to progress the curriculum in a way that we started very introductory and then was able to teach very advanced and technical concepts.

The Academy brought in experts to inform the group and incorporated tours to really ground those concepts and science that was learned.

The Shoreline Leadership Academy for San Francisco, comprised of seven junior and senior high school students throughout San Francisco, and over those 15 sessions covered Climate Change 101, all the way through San Francisco Planning Department and how they execute development agreements. Other topics included operational landscape units, nature-based solutions, habitat restoration, and also skill-based sessions like communications, grant writing, and funding mechanisms.

There were many tours in Bayview-Hunters Point community, as that was highlighted as an environmental justice community, and tours of the Embarcadero and the Southeast Water Treatment Plant as critical infrastructure.

The Contra Costa County Shoreline Leadership Academy was an intergenerational academy with 23 participants. Again, with informal sessions beginning from the overview of geography, land use, and the demographics of Contra Costa County, to talking about levees and permitting and how plant remediation can help contaminated sites. Even though BCDC's jurisdiction ends at the Delta, the Academy explored the similar challenges that the Delta and the Bay experience as a connected water body.

All participants created and presented final projects that put the knowledge that they learned into practice.

For San Francisco, the students produced a wide variety of final projects such as tabling at a youth climate summit, Bay cleanup and creating a Bay Watch podcast.

For Contra Costa the projects ranged from proposing permit transparency tools to middle school demonstrations on sea level rise and interviewing businesses on their sea level rise adaptation plans.

We asked the participants for feedback about this program through surveys after each session and phone interviews conducted after the completion of the program. We asked them to rate the overall program from 1 to 5. Overall, it was 4.4, which is very satisfactory.

And we were very proud that 100% of the participants that started the program in Contra Costa County ended the program and completed it.

A major point of feedback was providing an after-action plan and more resources to scale up their final projects, or a plan on how to make their project proposals into a reality.

The impact of this program is something that I would like to say is like a ripple in the Bay. It will go farther than any eye can see, and farther than we can track.

What is next is making sure these academies are known and that the knowledge shared and materials produced live on. We are exploring the continuation of the program. And we, after really hearing the participants, are going to plan an after-action workshop or event which brings those participants and connects them to resources so that they can expand on their projects.

With that, a special thank you to the creator of this program and my predecessor Phoenix Armenta, and a thank you to all the experts, all the participants, the guests, all of our partners that made these Academies thrive.

Now we will hear about an exciting tool that my colleagues created to support regional sea level rise adaptation projects.

Adapting to Rising Tides Data and Science Manager Copeland addressed the Commission: Thank you. Hi, I am Cory Copeland; I am the Adapting to Rising Tides Data and Science Manager. I am very excited to talk to you about what is the culmination of two years of work that we have been doing.

Before we get started, I want to do some thank yous right off the top for this tool. I want to start off by thanking our leadership who were very supportive of this, Jessica Fain and Dana Brechwald, without whom this would not have been possible.

And as any good project manager knows, it is only possible when you have good staff. I have great staff and so I want to thank Ujjay Siddharth and Aidan Williams especially whose efforts on this were critical.

We also were fortunate to be supported by MTC-ABAG as partners on this project and so today we are joined by Chirag Ribari, Michael Germeraad, and Kate Lyons, who you will hear from later, whose efforts were essential to this being successful.

You last heard from us in May on this. A ton has happened since then on the project and you probably will barely recognize the tool thanks to feedback from people like you.

I want to start off by giving a reminder of what this is all about. Much like Dana mentioned earlier, you are probably tired of seeing that impact slide. You might be tired of seeing this cost slide, and God willing, this will help us make this cost slide better in the future.

We have a huge adaptation need. Estimates put it around $96 billion. Whatever it is, it is an eye-popping number. We do know also that the cost of inaction is significantly higher than the cost of adaptation, and so we have an estimate that we put out previously of $230+ billion dollars. That is, I believe, likely an underestimate, but it speaks to the urgency of making these investments to protect our communities, our region, our economy, the state, and regional economy.

So that is why, as an agency, we have put so much effort into some of these things, and I want to pass it to Kate who is going to talk about some of that.

Ms. Lyons presented the following: Thank you, Cory; and, good afternoon, Commissioners. You have heard a lot about a lot of these efforts, but what I want to highlight on this slide is the collaborative work between BCDC, MTC and ABAG that has led through this timeline to get us to the Navigator today.

Back in 2021, MTC and ABAG's Plan Bay Area 2050, the region's long-range transportation plan, included strategy EN-1, Adapt to Sea Level Rise.

The same year, the Bay Adapt Joint Platform led by BCDC was passed, forging the path for regional action on sea level rise.

Both plans called for the need for an investment framework to estimate the costs and revenues for sea level rise adaptation, and an investment strategy to figure out how to make that adaptation a reality.

In 2023, responding to that call, MTC and ABAG and BCDC worked together to co-produce the Investment Framework. The Framework translated Plan Bay Area 2050's cost estimates into an updated cost figure and was the first report to produce the about $100 billion need that Cory just highlighted and has been widely cited since. The Framework also began to explore funding and financing mechanisms to meet the regional cost gap for adaptation.

Then, as Jessica highlighted earlier in her presentation, in 2024 BCDC, MTC and ABAG worked with a group of regional agencies and signed on to an Interagency Sea Level Rise and Flooding MOU. This formally designated BCDC and MTC-ABAG to partner on an investment strategy by 2026, and to be updated every four years thereafter, with BCDC playing the lead role. The Navigator directly responds to that call for an investment strategy.

And of course, we are operating in a post-SB 272 world, where shoreline jurisdictions are required to create sea level rise adaptation plans according to RSAP guidelines. MTC and ABAG played a supporting role in developing those guidelines, and as we move forward, our agencies together are thinking about how our regional planning efforts should incorporate this influx of plans and especially the proposed projects in those plans.

And finally, most recently, the update of our Sea Level Rise Strategy in Plan Bay Area 2050+ built on the 2023 Investment Framework, adding other criteria including timing and readiness, to create a Resilience Project List, a list of projects to protect the Bay Area from sea level rise through 2050.

The updated data from Plan Bay Area 2050+ built a solid foundation of data to feed into the Navigator. So, all in all we are proud that the Navigator is the culmination and the next iteration of regional sustained partnership between our agencies on sea level rise adaptation.

So, what is the Bay Adapt Navigator?

It is a living dashboard, not just a static report, that tracks the cost of sea level rise adaptation across the Bay Area and empowers users to explore projects and funding side by side.

The dashboard turns the analytical work from all of our collaborative regional work into something usable in real time by staff, funders, and advocates, and positions BCDC to lead the development of a coordinated investment strategy to make regional adaptation a reality.

So now I will turn it over to a video so you can see for yourself what the Navigator is and what it does.

(A video was shown.)

Environmental Climate Scientist Siddharth spoke: Hi, everybody. My name is Ujjay Siddharth, and I will be talking about how you can use the Navigator.

There are many ways that we intend that users should be able to use the tool. We really hope they can use the tool to achieve their own ends.

For example, if you are a grant maker or a funding agency, this tool can help guide your decisions on where to distribute technical assistance. It can also help you identify jurisdictions that best fit your specific funding criteria.

For example, if you are a funder and you are interested in proposed and planning projects, early-stage projects, or if you are a funder and you are interested specifically in projects that incorporate nature-based solutions, you can essentially customize your summary of the existing adaptation projects. And based on your customized summary you can see various information. You can see the costs of adaptation, and you can see the benefits to communities, to critical infrastructure, transportation facilities, and networks.

If you are a local planner, say for example you are a local planner from Alameda County, you can view key project information for the projects in your specific jurisdiction.

And as a local planner you may want to check that the project data is up to date. Having your projects in the tool now elevates them and makes them more visible with funders and other key stakeholders in the region.

This tool is also meant to serve advocates. If you are an advocate, you can generate customized snapshots tailored to a specific funding ask.

For example, advocates for habitat and restoration in the Bay. They can easily customize their summaries to view costs and benefits for projects that have a habitat component.

Finally, if you are a grant applicant you can connect to funding portals with existing opportunities. In the tool we connect to the California State Grants Portal, we connect to the Coastal Funding Database, and we also connect to the BayCAN Funding Tracker.

There was a lot of work that went into creating the Navigator. Our Steering Committee involved over 18 organizations, local, regional, state, and federal partners. And throughout the past couple of years, we have received input on useful features, different layout designs. We even organized a technical subcommittee where we vetted our methods specifically, for the analysis where we measured regional and project benefits.

Since May when we last talked to you, this also shows all the outreach we have accomplished as well.

We tested the tool with 13 organizations with 37 different users. We had two specific sessions with local jurisdictions, and we solicited their input on the usefulness of the tool for them. So local jurisdictions were able to provide input specifically on this tool.

This is all to highlight that this was a very collaborative process. We spent the past couple of years working with our Steering Committee. We spent the past couple of months working with user testers from various different organizations. And so, this is just an opportunity to really express our thanks to our Steering Committee and to our tool testers. None of the improvements of the tool that we have made would have been possible without them.

One of the greatest features of this tool is that we are not asking for any new data inputs. We are taking advantage of an existing database, something you may all be familiar with already: EcoAtlas, the Shoreline Adaptation Project Map. Locals have updated this database annually since 2021. For years we have been asking for this data and now we are taking this data and making it actionable. Through Bay Adapt Navigator the data is now easier to access, it is easier to analyze, it is easier to visualize.

We are in the fifth year of the annual SAPMap update and we are now in 2026 and so we are asking for project updates from locals around the region. The deadline for that is October 30. Now is a good time to check in on sea level rise adaptation projects in your neighborhood, sea level rise adaptation projects that your jurisdiction is responsible for, just to ensure that the data is updated and kept fresh throughout this process.

Finally, looking to the future and the long-term vision for this process.

The EcoAtlas SAPMap database is where we intend to upload projects from the RSAP subregional plans. This data pipeline that we are building today will connect the subregional plan data to Bay Adapt Navigator. Really the ultimate goal of this is to create a living resource of all sea level rise adaptation projects around the Bay. We want to make that data publicly accessible and always available for analysis. Thank you and I will pass it back to Cory to wrap up.

Mr. Copeland continued: Thank you, Ujjay. So, we understand that a tool is a tool. Strategy is more than just a tool, and so we are very excited to be taking information and insights from this tool and using them to start informing decision-making throughout the region.

So, what we are going to be doing in the coming months and probably years is supporting users of the tool and encouraging policymakers to consider insights from it. So, we believe users will use the tool to help align regional advocacy around their priorities and to help make sure that the data is reflecting the priorities that they believe in. Or I guess the other way around maybe, that the priorities they believe in are reflected in the data.

We also want to use the tool to inform and support planning activities in the region, so we talked about the linkage between this and RSAP. We also will be coordinating with MTC along with efforts related to Plan Bay Area 2060 and continuing to make a really useful pipeline to the major regional planning efforts with this data.

Finally, we plan to work to build consensus around funding priorities and use insights from the tool to work towards a regional roadmap to address these critical funding needs that we have identified.

The tool is going to stay up to date with annual updates or even more frequent updates as needed to keep the information living, relevant, and impactful. We are excited to shift from a ‘every few years a report drops’ into a ‘at the touch of your fingers you can have instant analysis in minutes.’ We are very excited that that will be the outcome of this.

I said a lot of my thank yous at the top so I am going to use this instead to plug a few things.

First of all, the project website is bayadapt.org/Navigator. It is live right now and you can go access it. We strongly encourage anyone here to do so.

We are also very excited to go to your jurisdictions, organizations, and talk about it, demo it with people. If anyone listening, either on the Commission or just in the public is interested in that, please, please let us know.

We are also making a public webinar available on October 13 at 1:00 p.m. We have a link to the registration for that on the slide above.

Ujjay already pointed this out, but the annual update of the underlying dataset is going on right now. If you are aware of a project that is a new project or a significant status change of an existing project please connect with Todd Hallenbeck, his email is up there, or attend one of our office hours to support that. And so, with that I am going to pass it back to Jessica to take us home.

Ms. Fain continued: Thanks, Cory. I will just close this out because that was a lot of information, but I will just do a quick What's Next.

Advancing our regional shoreline adaptation planning is the number one priority of our agency so you will see a lot more of that moving forward.

We are also, as Dalila mentioned, looking for new partnerships and funding really for Shoreline Leadership Academies. So, if your jurisdiction or you know someone that is interested in such a program, reach out to us, we love to talk.

Cory and his team are going to be doing a lot of outreach around the Funding Navigator. Again, if you would like a presentation, please do not hesitate to reach out.

And we are also going to be doing a lot of communications and telling the story of this, and hopefully in a way that really resonates with people where they are at.

This looks like things like our third annual Rising Together Summit on November 9.

It looks like the Restore America's Estuaries conference next week. We are going to be presenting to a lot of technical experts and others who are thinking about this issue.

And it is also thinking about our other tools, social media, and other things to really tell the story.

What we did not touch on are a few other things that are on the horizon, and we will come back to you to brief you on these later as they get going.

They include updating what we are calling a Strategy Refresh of our Bay Adapt Program. It has been a little bit of time, and we want to make sure it is still useful.

And we are also looking at how we advance some of these key areas around funding and policy, specifically around some governance questions.

And then lastly, as you know, on October 15 you will have a chance to hear from the public, and we would love your thoughts as well, about our Bay Plan Amendment on Beneficial Reuse, which is yet another lever that we have to think about how we adapt as a region.

So, thank you so much. I think I just have a slide to thank the entire team, and we welcome questions. Thank you.

Chair Wasserman asked: Do we have any public speakers?

(No members of the public addressed the Commission.)

Chair Wasserman continued: Questions, comments from Commissioners?

Commissioner Nguyen commented: Thank you so much for the presentation, especially on the Funding Navigator. I was trying to go there, but I will ask you the question here: Is there a way to find out, or how do we find out how many users use it and actually got money?

Mr. Copeland replied: Yes, that is a great point. We can track how many users go to that URL bayadapt.org/Navigator. Our platform does not let us track really specific things. It is a limitation of the tool we used to build it, the framework called Power BI. But we can at least see how many people have come to it at all. It would be great. I think we should, as we kind of go through, track funding. There is an opportunity to track how much funding people get in general, whether or not they use the tool. That will always be up to date as long as we continue to do our outreach and get people to update their funding achieved when they complete projects. That is something we do track. Hopefully that little bar that has $4 billion in it now will keep growing and we will get to keep seeing more funding coming in.

Commissioner Gioia was recognized: Thanks for the presentation. I am involved in our Contra Costa Regional Shoreline Plan that we are working on, trying to also partner with several cities along the shoreline.

You asked where there can be value-added. I do think there the benefit of working to support the subregional efforts that are underway to develop resiliency plans would be most helpful, and maybe even serving as a sort of an entity to help networking among the different regional efforts to learn from each other. I think that would be helpful. Because I know there's a lot of good efforts around, going on around the Bay, and we always are interested in hearing about some of the subregional, multi-jurisdictional efforts underway in other counties.

And BCDC staff have been great. We had our Shoreline Academy in Contra Costa. They actually just came to our Board of Supervisors on Tuesday. They are helpful as advocates, be great to do more of that around the Bay.

But again, I think value-added in helping develop best practices among the different regional efforts and supporting those efforts.

Obviously, funding is key and supporting funding efforts.

We are doing this a step at a time, right. These regional plans are really important as the first step to actually do the planning, because I think then we have to look at how are we going to institutionalize the implementation of those plans. Because right now everything is basically voluntary. The quicker we can get these plans done way ahead of the state's schedule, the better we can work on getting funding to implement them.

Commissioner Cox offered explanatory remarks: I just wanted to explain why Sausalito was not on the list of jurisdictions that have already commenced the RSAP process, and it is because we actually commenced our efforts before the passage of SB 272. Under our former mayor Janelle Kellman we obtained a $1 million grant to undertake sea level rise planning and adaptation efforts.

The Council received a presentation from our Resiliency Manager Catie Thow Garcia last November and gave direction for how to update that Shoreline Adaptation Plan. We have hired a consultant, F&L, and are planning to reach out to BCDC this fall to engage in the RSAP effort.

Chair Wasserman commented: I do not see any others, so I have a couple of questions.

I very much appreciate that information. Why isn't Sausalito on our list?

Ms. Perrin-Martinez answered: So, I was very specific in what we put out. It is either local governments that have officially initiated with us. We have a process laid out in the RSAP of what a notice of intent to initiate a subregional plan looks like. This is just a very technical process.

The second slide was all local governments that have been funded by OPC and have been awarded funds but have not yet initiated with us.

I did mention just verbally that there are a lot of local governments that we are in conversation with that are making efforts in that, but there is nothing that is official. I do not want to list what local governments are doing if we do not have a really clear public process in place for it.

Chair Wasserman replied: Close, but not magic. I understand that you are in discussion with jurisdictions that have not really initiated, they are their figuring it and so forth. That is not Sausalito. And I appreciate that Sausalito has not reached out and formally registered, I appreciate that. We need to be more proactive than that. And I am not saying you are not actively coordinating. We can have further discussions on this offline.

I just want to make very clear, given what Commissioner Cox has described Sausalito should be on our list. So, we need to look at our process. I do not know whether they are unique in this sense or not. We need as accurate a list as possible, as consistently and as frequently updated as possible.

Commissioner Cox added: Yes, I will say we have been obviously meeting with Marin County because, as Commissioner Gioia mentioned, this is such a regionally important effort. And we were considered sort of the hare because we had commenced these efforts before SB 272 even passed, and we already have a Draft Shoreline Adaptation Plan. We just did not commence the formal process with BCDC because we gave direction about how to improve that plan, and we wanted to have it in better shape before.

Chair Wasserman responded: I am not criticizing Sausalito. And I am not really criticizing. I am saying I appreciate the explanation. We just need to be more aggressive in certain respects.

My second comment. I very much appreciate that the cost estimate of adaptation has come down from $110 billion to $96 billion. I will not get into whether I believe that or not, but my comment itself should tell you where I am leaning. But I do want consistency. On one of your slides you have got $90 billion. I recognize this figure changes over time. Our figure needs to be consistent. Because these numbers are not exact. They cannot be exact. I absolutely appreciate that. They should be consistent.

Mr. Copeland responded: Yes. I think that one of the new realities of this is actually that they are going to be really inconsistent, they should change with up-to-date data.

After this October's updates I would candidly expect the number to change to take into account any new projects. I would be shocked if it goes down this time, to be honest. This went down for a very particular reason that Plan Bay Area used a cost of escalation estimate that the tool does not use, where it tried to predict when something might be implemented; we are more agnostic to that. But yes, I will say it is very likely to shift with new, better information in the tool.

Ms. Fain interjected: Can I just explain maybe just a little bit on that? So that 96 billion, 100 billion dollar-ish number is based on projects that we know and projects that we are guessing about. And so over time those projects that we are guessing about are going to be projects that we know, and so that might bring the cost up, it might bring the cost down. And so, there is a benefit to having both numbers, maybe. There is a benefit to having an accurate, as accurate as possible outlook about what we think the actual costs are going to be. And there is the value of having a talking point of this is what the cost of the region is going to be. So that is just a tension, I think, with the data and how we are working with the data, versus the need to communicate a message that we sort of grapple with when we put out these numbers.

Chair Wasserman reemphasized several points: I understand this is a tough challenge. I very much appreciate that. And I also appreciate that these numbers are so large that the difference between 90 billion and 96 billion may not, in fact, be important. But I think there is a credibility issue here. We can absolutely and should say these numbers are changing because they include estimates. And even for those projects where we have got the project defined and so we have got a number, that number may change. We all know that when projects go to bid the number usually goes up. Occasionally, it comes down, sometimes it is exactly right. These will change; they will change over time.

All I am saying is that I think we need to make a very significant effort that at any particular moment in time, and I am not saying daily because all of this can shift and these numbers are in a number of different places. But at a rough moment in time, we should be as consistent as possible. And it may well make sense for us to have a number with two numbers underneath it, or in fact, two numbers. I am agnostic on that issue, although I think more information is probably better in this. And again, we do have a message that is very hard to get out there, and I think consistency across the board, recognizing changes from time to time and even frequently, are important.

Commissioner Eklund was recognized: Thank you very much. I want to first thank you all for doing a great presentation on a very complicated project with a lot of jurisdictions.

I just wanted to ask. I guess cities and counties are all going to be doing it at a different pace. So, it would be helpful for me to know who are the ones that are just starting out, the ones that have hired consultants, or whatever the different steps there may be. Because I know that Novato made the decision to work with the RSAP with the County and so we are not getting that much information about what we are doing. So that is something I am going to bring back to our city manager. But it would be helpful for me at least to have a better understanding where the different jurisdictions are at different stages, just so that we can help prod things along which is going to be important for cities especially that are going to be bringing up the rear. Comment from the peanut gallery.

Chair Wasserman asked: Any other Commissioners?

Despite my comments, I want to be clear. I certainly agree, this is terrific work. The improvements since the last time we have seen it are terrific. Having this tool available is a tremendous piece of getting us where we need to be. So, thank you all for the very hard work.

Commissioner Ramos commented: I just wanted to echo the comments that Commissioner Eklund stated. I do think it would behoove us because we are on a, gosh, what now, eight-and-a-half-year trajectory on which these plans are due. I think it would be very prudent for us, and I have said this in terms of making sure that BCDC is able to provide the technical support for the development of the RSAP of each jurisdiction, that we survey the jurisdictions on an annual basis of, where are you at. So that that compilation, our staff knows and we can see as a region how we are moving along.

I offer that as up as suggestion because I do believe that if a survey were to arrive at my staff's inbox that would really help me along to look at coordination. And that would also give us a sense. One of those questions could be, are you doing a joint RSAP with other jurisdictions, right. So that we did know that at the beginning that there are a few like the OneShoreline program and a few others that are having joint plans. But I think that that would be in our best interest so that we can track this and we do not arrive at the 10-year deadline and saying, oh, we are only going to be 60% complete.

We do this on the ABAG side with housing elements and keep track as when they are submitted and the progress of those elements. I think that could be an example as to how we also keep track of these RSAPs being developed.

Ms. Perrin-Martinez added: I do want to just mention that we do have a public tracker for plans that have initiated. So, any plans that have come to us that are in an official process, they are funded and/or we know they are working on a compliant plan, that is available, and so you can see which jurisdictions have initiated.

I think the question is more of the plans that have not yet initiated and the conversations that BCDC staff are having with local government. Those are ones that we do not share publicly because we want to wait until the local governments are in a space where they are comfortable beginning that process with their constituents.

But we do offer that. Ideally as more and more plans come into notification with us and progress, you will see those changing on a public interface, both when they initiate, when they submit. We have a variety of categories that we will be tracking.

Commissioner Eklund chimed in: I appreciate your comment, but I do not think that is enough for me and some of the other elected officials that serve on this body. Because I believe that we have a role to play, and that we need to help sometimes push on our end to make sure that the city and the county or whatever are really diligent about doing the work and also involving the community in putting together this plan. Because you are not developing a plan in isolation, I hope, and so there has got to be some public outreach.

If the elected officials in any particular community are not being engaged in this, then there already is a problem, because that is really the first step of getting the community engaged is to make sure that the governing board actually is engaged as well.

So, I do not think just having a copy of the plan or whatever is adequate for me to be able to get a notice about where the 101 cities and the 9 counties are going to be. So, anyway, just wanted to let you know that I just think it is important for BCDC to be engaged early on and have a really good perspective of how that city or county is working and what are some of the things that we can do to help urge them along. Which I think would make sure that everybody will have a complete plan by the deadline.

Chair Wasserman continued: Others? I do not see any others.

Thank you very much for the presentation, the quick tour around. And it is important to see that because there is a lot happening. We have a huge amount to do, as we all know, but we are making some real progress, and we thank you for that.

10. Briefing on the Exploratorium's Public Sea Level Rise Education Initiative. Chair Wasserman announced: That brings us to item 10, a briefing on the Exploratorium's Public Sea Level Rise Education Initiative.

We will receive a briefing from BCDC staff and Exploratorium staff on what is being done on this project that is part of the amendment to the San Francisco Waterfront Special Area Plan approved last year by the Commission and the amended Exploratorium's permit. We know that construction is underway, and that is exciting. Ben Dorfman of our staff will lead off the presentation.

Coastal Program Analyst Dorfman presented the following: I was making some last-minute edits to my speaker notes based on the Chair Report and I accidentally wrote, Happy Birthday, Chair Wasserman, but it is not quite right. It should be, Happy Birthday, BCDC.

Thank you, Chair Wasserman, and good afternoon, Commissioners. My name is Ben Dorfman: I am a Costal Program Analyst with the Long-Range Planning Team here at BCDC. Today, along with our partners from the Exploratorium we are going to give an update on the Exploratorium's Public Sea Level Rise Education Initiative.

So, a quick overview of the presentation.

I will start with some background on what Chair Wasserman referenced, Bay Plan Amendment 3-17 that approved this project last year.

Then I will go do a brief refresher on what that Bay Plan Amendment said must actually be in the Education Initiative itself.

Then an overview of how we permitted this project.

And then finally I will pass it off to Emma from the Exploratorium for the bulk of the updates today.

If you take a look at this map here, you can see the red arrow pointing at Piers 15 and 17 located in the northeastern waterfront of the Port of San Francisco's jurisdiction. This is where the Exploratorium is located and where the bulk of the project will take place. This map itself is from the San Francisco Waterfront Special Area Plan, SAP for short.

And some more refreshers: SAP is a very specific local application of the Bay Plan, which the Port of San Francisco and BCDC collaborated on and built together.

The SAP carries equal weight to the Bay Plan, which is why it requires it be a Bay Plan Amendment to amend it.

And the Bay Plan Amendment that I have been referencing, BPA 3-17, amended the SAP and improved the Sea Level Rise Education Initiative as a required public benefit. As part of the SAP development process, certain public benefits were identified that the Port and related tenants must provide as required in the SAP. So, just a reminder that this Public Education Initiative is one of those public benefits that is required in the SAP.

The Education Initiative dates back to last year when the BPA 3-17 was voted on and approved.

The amendment did a few different things, but what we are talking about today and one of the primary component components was approving a public benefit swap at Piers 15 and 17 at the Exploratorium. And the swap removed a Bay fill removal requirement public benefit and replaced by the Sea Level Rise Education Initiative public benefit.

The amended SAP incorporated four new policies that specified how this Education Initiative must be implemented. I will go over those next.

I want to spend a little bit of time on these policies as they are important, and the Education Initiative must be consistent with them and the SAP. They also guide the more specific implementation that we wrote in the permit.

Sea Level Rise Public Education Initiative Policy 1 states that the program shall achieve its primary goals of increasing public understanding of sea level rise in the Bay Area, elevating public awareness of regional adaptation initiatives, and expanding student engagement with sea level rise content.

Policy 2 states that the Education Initiative shall be free and publicly accessible.

Policy 3 focuses on developing timelines and performance metrics.

And Policy 4 states that the Initiative shall incorporate equity, environmental justice, and community engagement throughout its development.

We believe that the Education Initiative, as currently planned and permitted, will successfully accomplish these goals and satisfy these policies.

Work that is been going on since the approval of BPA 3-17 last year involved staff from BCDC, the Exploratorium, and the Port of San Francisco, working together to amend the Exploratorium's permit, which is a BCDC permit number 2006.009.10, to incorporate these new sea level rise education policies and actions into the permit itself, and to work out the finer details that were not covered in the high-level goals of the BPA process.

This was a unique project to try to permit. Kind of the first of its kind at BCDC. We are usually permitting physical projects along the shoreline in the Bay. While this project does have some physical components, we also had to figure out the best way to permit education concepts, teaching plans, and sea level rise visualization techniques.

We eventually got there successfully through some really great collaboration between all three agencies. The final permit, which was issued in June of this year, includes implementation, monitoring, and evaluation requirements.

With that background in place, I will pass it on to Emma and the team from the Exploratorium for some project updates.

Ms. Greenbaum addressed the Commission: Thank you, Ben. Thank you, Chair Wasserman, and Commissioners, for giving us some time today to update you. My name is Emma Greenbaum. I am the Project Director for Climate and Landscapes work at the Exploratorium. I am here with my colleagues Laura Zander, Melissa Lunden, Rob Semper and Susan Schwarzenberg, who you will hear from in just a minute.

We have been over the goals of the Education Plan, you all have seen this. But wanted to reiterate, as Jessica mentioned, this is a huge El Niño year, so it is a particularly important time for the public to have places to come together to learn about sea level rise and become curious observers as they are starting to see these changes in their communities.

We have had really a front row seat to sea level rise on the Embarcadero at Piers 15 and 17, and we have used that opportunity through the Bay Observatory and through the work that we have been doing on the Education Plan to understand what the impacts will be to our site and help understand what the impacts will be to the region.

We have also been taking our educational tools all around the Bay, so taking them to communities like the Canal District, Cooley Landing in East Palo Alto. So, places that will be first and worst impacted have been creating partnerships in those places, bringing our educational tools and also learning from communities that are doing work on the ground.

We have also continued our educator and student engagement. We get to work really closely with our educators to hone these different tools. A lot of the exhibits that you will see in a minute were created in collaboration. So, what do teachers want to be learning about. What are the learning tools that our teacher-educators might use in some of their trainings.

So that has been an iterative process. And then those teachers that come to the trainings bring those tools back to their classrooms all around the Bay and across the state.

We have also been doing this in collaboration with folks all around the Bay. We are excited to host again the Bay Adapt Summit on November 9. We hope we will see you all there.

For the bulk of this we wanted to talk about the Waterfront Field Station. That has been kind of the biggest elements that have evolved since last we came to speak with you. The Waterfront Field Station is really kind of the crown jewel of the built elements of this Education Plan.

We see this as a public learning laboratory. This is a place where exhibit experiences, landscape interventions, and our place-based pedagogy we have been honing come together to offer this window into the challenge of climate change through this lens of sea level rise and local impact.

As we do testing all of these things out, everything is a prototype unless it goes really well and then we always meant for it to be that way. Lots of these things have been tested across the Bay, but have also been tested at our site which we learn a ton through just talking to the public about the different concepts in the exhibits.

Some site plans and perspective views.

This is our Waterfront Field Station. Again, this is landscape elements and exhibits that we are hoping to create this cohesive experience.

The Embarcadero is a very harsh environment, as you all might know. So, creating a space where people can be comfortable, they can sit down, we have a little bit of a wind break, we have a little bit of a sound barrier with these landscape elements, is really important to creating physical comfort so people can learn.

This is a little bit more of that perspective. You can see how the exhibits are going to be integrated into the landscape elements as well.

This area we are really excited about. The busses for our field trips drop off right on the right side here of your screen in front of the towers. This kind of classroom area we are looking to set up is going to be really useful for educators orienting around the different exhibits. Front and center will be the Shoreline Flood Explorer that students can learn about right off the bus before they even go into the museum. And again, this will all be free and open to the public, so you do not have to buy a ticket. You do not even have to tell us you are coming. You can just come and gather and learn about sea level rise here.

And the last element I will touch on for this is for these towers we created an overall graphic that shows intermediate sea level rise projections out to 2100.

One of the really exciting parts of this is we were able to bring on SCAPE Studio. They are a landscape architecture firm that has been really out front on natural and nature-based solutions to sea level rise. When we wanted to bring in landscape elements that would convey the concepts around sea level rise, we knew we really wanted to work with them.

The concept they came up with for us that we worked on together is a wrack line. The wrack line is where you can see the high-water mark debris along the shoreline.

So that is the concept that we have followed through the landscape elements of the field station, to bring in that idea of softening the edge of the shoreline as a response to sea level rise.

I will hand it over to Susan Schwarzenberg, the Director of our Bay Observatory, to tell you about our exhibits.

Ms. Schwartzenberg presented the following: Thank you for having us here today. This has been a super exciting project to bring a good big chunk of the Exploratorium out on the street.

Again, this is our site plan. The towers both have text and information; but also exhibits integrated into them and around the wrack line units, and one exhibit even in the wrack line unit.

One of the exhibits, of course, is the Flood Explorer. It can be used for groups or one person. There's two screens, a very large screen, so you can go around the Bay Area, look at sea level rise predictions, and talk to a small group or a large group, or do it on your own.

The other towers, some of them have information. We go through: What is sea level rise? Why is it happening? What are we doing about it? Solutions. Who is doing this? The kind of governance we need. The kind of community activity we need. And how do we know what we know is another really important aspect of what we are trying to show.

One of the towers is a data tower, and it puts data from our sensors out in the street. We worked with our new science educator and scientist on creating really easy-to-understand visualizations. We know people need to learn how to read data to understand what is happening, but we have tried to work as artfully as we can to show the Bay in motion, how tides work, CO2 in the water and in the air, different weather patterns. We also have surface currents. Really trying to show that we know what we know because we have been measuring, in some cases for a century, especially around sea level rise.

Another tower is something we call Photo Voice. We had a civics science fellow last year that gave cameras to various community members all around the Bay. They went to the locations that they like, that they are worried about, and they talked about why do they go to the Bay? What is it they like about the Bay? But also with these new predictions, what are they worried about? What do they know is happening? In some cases, people went and looked at horizontal levees. In some cases, they went to flood zones that are already happening. In other cases, they went to beaches and wondered, will they be here in the upcoming years?

Shifting Shorelines is an exhibit that is quite large, as you can see. It is a series of maps from 1853 to today, showing how the shoreline has changed in San Francisco. As you know, Yerba Buena Cove was where the Bay was all the way from where our building is to the Transamerica Pyramid, so quite far away. We filled that land to make the Embarcadero what it is today. And this series kind of helps people see how that happened slowly.

Here are some of the maps we use. The very last one, if you compare it to the first one, the first one is the old shoreline. The last one is a prediction for 36 inches of sea level rise with a storm surge. You see that water has a kind of memory; it will go back to what it used to be.

This is another exhibit, we call it the Sea Level Cylinder, and it has over 180 years worth of tidal data. San Francisco has the oldest tide gauge in the Western Hemisphere. It was self-registering it, so it is a mechanical piece of equipment, and it recorded tides mainly, as we heard earlier, the problems of navigation in the Bay. Even when there were no bridges there were an extraordinary number of shipwrecks, so the U.S. Coast Survey developed this instrument and then took these measurements. Today it is not so much about navigation as it is about what it tells us about sea level rise.

We also found it a challenge to talk about infrastructure with people, especially right underneath the sidewalk where everyone is walking is the seawall. We tried to put a camera underneath. We tried to light it. We tried to get people on their knees to try to see it. And we had maps and images and everything else. We finally have made a bronze model of it, so this is a cast bronze model. You can see that big rock dike. So, when we talk about the challenges with the seawall in the future, especially since it is a century old and it is at risk for not only sea level rise but earthquakes, they kind of know what we are talking about.

We also celebrate our Ohlone partners with a particular bench area that really has them talking about their relationship to land and water. One part integrated in it is a kind of a timeline of Ohlone relationship to land, and then the very brief period really of Europeans coming and changing the landscape.

This is our plant palette. It is all native plants.

And here is just a little bit. This is really happening. These are actual images of these things getting built. You have been looking at pictures for a long time, but they are in our shop, and we are putting everything together.

There is the bronze model. And it has all the infrastructure in it. You can see where the sewer is, you can see where all the power lines are, so it really helps people understand what they are paying for if this ever becomes a bond measure.

Here is our data tower, the Bay stories.

Here is our timeline. We are working like crazy right now to get the thing built. We think it will open early in November. Along the way we are still doing our teacher workshops. Field trips start next week. We are planning some King Tide walks coming up. And of course, we continue to collaborate with communities, with BCDC, and with the Port to pull this whole project into 2030 when we think the Embarcadero might be all torn up.

So anyway, I am going to turn this over to Rob. Thank you.

Mr. Semper addressed the Commission: Hello, Commissioners. My name is Rob Semper, I am the Chief Science Officer, and I just want to end the presentation by making a few remarks.

Eight years ago, I had a chance meeting with Alex Zwissler who you may know. He was a Commissioner from a few years ago. He was also head of the Chabot Science Center. We were at a conference in Connecticut, and I had lunch with him and I said, hey, what can we do about talking to the public about sea level rise. And he said, BCDC is very interested in getting the public to know about sea level rise and what the issues are.

So, he kindly introduced me to Zack and to Larry. We had a meeting two months later, and we concocted an idea to see could we actually create a project that would actually combine the work of BCDC and the Exploratorium, and our partner support by the way, to talk about this.

So now here we are. Seven years later it was permitted. It was passed by the Committee here for the change in the plan.

This June we got our permit and now construction is underway.

So, it is time for me to say that this has been, I think, an incredible ideal public-private partnership with three different agencies. Along the way, we have learned a lot from each other. We have learned a lot about how our partners work, how we work, and how we can work together.

And it is so exciting to me that we are close to opening this and starting this project.

I just want to thank BCDC. I want to thank the staff. I want to thank the Commission and Zack and Larry. Zack especially, your vision about pushing forward on this has been so important so thank you for the support we have had over these years. I will stop there.

Chair Wasserman acknowledged: Thank you, Rob. Sierra, do we have any public speakers?

(No members of the public addressed the Commission.)

Chair Wasserman continued: Commissioners?

Commissioner Nelson commented: Terrific presentation on an incredibly important issue, Chair Wasserman. This has been a real priority, making sure that we are pushing public education regarding sea level rise, so congratulations to you on this.

My question is about evaluation and how you are going to do that evaluation. Obviously, we want to know how many people we reach. But more importantly, we are going to want to have a sense of how impactful this kind of education program is. What kind of impact it has on the people who will take advantage of it. I was hoping you could walk us through. You have done a great job of talking about what programs you are putting out there. Could you give us a sense of how you are planning to evaluate the effectiveness of those programs?

Ms. Schwartzenberg replied: Yes, we have a Research and Evaluation Department at the Exploratorium, and we have already started researching a bit what impact this has in terms of helping people understand the complexity of this problem. It is sometimes called a wicked problem that it is so complex there is no one solution. And so, we have learned that some of the exhibits are actually helping people gain tools so they can begin to understand that it is about community, it is about science, it is about governance, it is about society; and to put that all together you need some skills. You need to be able to imagine the future. You need to be able to remember the past. You need to be able to understand data. And these are the kinds of things that we are learning and trying to really develop in the exhibits.

But we also have some statistics about how many people are on the Embarcadero and it kind of ranges from about 800,000 a year to a million. And then we have thousands of school trips every year, and this will be their orientation area. So, we are taking the kind of quantitative numbers as we as we learn them from the Port and from just our own attendance, as well as what kind of impact, how are people using this information. So does that answer your question?

Commissioner Nelson answered: It does. It is that last reference you made about the impact the program is having, and I recognize that is a challenge to measure. But as I said, we want to make sure not just that we are reaching a broad slice of the public, but we are also making sure that we are doing everything we can to make sure we are designing programs that are going to be impactful. So, anything in your evaluation that you can do that will help us evaluate not just the reach but the impact and help us design together other programs in the future would be really valuable. Thanks.

Mr. Dorfman added: Really quickly, just on the permitting side, the Exploratorium already had an annual report due to us every year, so we just added aspects onto that like just the numbers of people enjoying their field trips, visitors along the Embarcadero, as long as the more substantive evaluations they are going to do, to get the concepts that people learn as they leave, through different surveys. So that is all going to be in the annual report that they give us each year.

Commissioner Eklund chimed in: Great presentation, great production, and I am really excited. The Exploratorium has been a very big part of my life throughout, so just really am glad that you are really tackling this.

A couple of my questions, though, is that not everybody is going to be able to come into San Francisco. So, have you thought of maybe a traveling museum or a way to help replicate this in other parts of the Bay Area? And then I have a second question. So, are there any thoughts about replication or a traveling museum?

Ms. Greenbaum stated: So we have been taking these learning tools all around the Bay already. That is in part what we have been feeding back into our process. We intend to keep doing that. We have found that it works better when we are in partnerships with local organizations who are asking us to come in, we bring our learning tools, and we can use them together.

There is within the scope of this thinking about whether or not there are other appropriate places for the exhibits we have built so far, but anything being off of our premises creates issues. Our exhibit developers spend a lot of time thinking about how people might destroy things, and things need to be repaired quite a lot. We can do a lot more at our site. But finding other partners who want to essentially take on some of the exhibits, or learn about making exhibits, we are interested in that.

Commissioner Eklund continued: I would love to have more discussion about that because I would really like to see some of this throughout the Bay Area, because not everybody is going to be able to come to San Francisco.

And then, are you tracking where the people are coming from? So at least we get a better understanding about are they coming from Solano County or Napa or whatever?

Ms. Greenbaum replied: Yes, we have sort of hard numbers on the field trips, so field trip data, we kind of know where educators are from. We will do kind of periodic evaluation of just people who are walking down the Embarcadero, where they are from. But we can tell more of the impact through the data we get with working with students or field trips.

Commissioner Eklund asked: Who do you send that information to of who is visiting the Exploratorium for this exhibit?

Ms. Greenbaum answered: I think if we wanted some geographic information to be a part of the annual report-out, we could do that.

Commissioner Eklund opined: I think that would be very beneficial to us, very much so. Thank you.

Chair Wasserman continued: Any others? I do think the geographic information as part of the annual report would be good.

Commissioner M. Tam was recognized: I just want to say how I think this was a really creative way to retain public benefits as part of the San Francisco Waterfront Amendment, and it is really great to see the progress that is being made. I actually happened to see it last night and said, oh, I think that is part of what BCDC approved with that program. So, it is great to see that it is making good progress, and I think it is a really accessible way. People can come and learn about sea level rise without even having planned that they are going to learn about it. So, I think it is also just a really great way to have that accessible education. The design is incredible. I love seeing that it is both a placemaking opportunity too and an educational opportunity, so hats off to everyone who has been working on this.

Ms. Greenbaum acknowledged: Thank you. We really appreciate that.

Chair Wasserman continued: Just a couple of comments. Following up on Commissioner Nelson's comments and Commissioner Eklund's. Tracking impact is really hard, for almost anything. I think in this context it is even harder because you are intentionally and productively reaching out to as many people as you can touch; but your touching them may be light, and following up on that is hard. You may have this already or plan to build it in, but if you do not, adding a voluntary survey response to the kiosks and to others is one way to sort of expand that. It is obviously not as scientifically valid because you are getting a voluntary group, but nonetheless you are reaching out in that way.

I just want to tell you how pleased I am. Yes, this has taken a lot of time. But we are now making much quicker progress, and I very much appreciate this. I think it is a very, very important part of our of our outreach.

And to echo the comments we just heard, I have a friend who I talked to over the summer who I think they visited the Exploratorium, but I am not sure. They certainly were on the Embarcadero in front of it. And their seven-year-old, even some of the information you already have out there on the seawall, was very interested and it worked. I mean, it got him more engaged, more information. So, it just says, when we get this information out there, people do care, they do pay attention. It does have an effect and an impact. So, thank you very much. And thank you, Alex Zwissler.

Commissioner Nguyen chimed in: Thank you for the presentation. The Exploratorium is actually a big part of my life and my kids' life growing up from the original location.

I have a question on slide number 17, the line that shows the sea level rise. I was not sure, is that the high or intermediate high by the color, or the color corresponding or not? But really the bigger picture is we show in these exhibits what sea level rise is.

And I was on the last slide when you show the workshops end at 2030. I was wondering why it ends there, and then you said, well, because it is going to be underwater. Which triggered my thought, how do we show the impact of sea level rise, not just what it is, in terms of loss of land, housing, or impacts on our Bay and community. What kind of exhibit would actually show that?

In my work in Caltrans on the Route 37 we have an exhibit that shows by 2050 if we do not do anything portions of Route 37 would be underwater, and by 2100, it would be completely underwater. We have a photo of a person standing in the water and water would be up to the knees, and to me it was very effective. But in this educationally, it is so important to show not just what it is, but how do we show the impact? And then you show a little bit of adaptation that we do. But as far as if we do not do anything collectively, then we lose the Embarcadero, we will not be able to travel, or housing will be different, and what community will be affected most.

So anyway, that will be my comment. But thank you for your work. Thank you.

Ms. Greenbaum replied: Yes, thank you. And just a point to talking about evaluation. I feel like the best data I always get is kind of what you were saying just now, Commissioner. This place has been a part of my family, this has been a part of my learning experience, so I think capturing those stories is something we also want to get through this evaluation.

We have approached showing the impact in a couple of ways, but one of the main ways is through the Shoreline Flood Explorer that we have made a simplified version of. Within the Shoreline Flood Explorer people can go look at wherever around the Bay is important to them and look at the different time horizons like they can online with the tool.

And we have also selected a few points of interest. Here is a good example of how transportation infrastructure might be impacted. Here is a good example of where water infrastructure might be impacted. Here is a community that might be impacted. So, that is one of the ways.

Then also through the Bay Stories we have brought in this narrative element. So, people telling their own stories about the places they love that will be impacted by sea level rise.

We are trying to do it in a few different ways, both through hard numbers data and also through narrative data.

Chair Wasserman continued: Thank you all. Thank you very much.

11. Adjournment. There being no further business, the Commission meeting was adjourned at 3:54 p.m.