Downtown San Francisco Ferry Terminal Expansion and Public Space Improvement Concepts

PRELIMINARY DESIGN CONCEPT PLAN

Prepared for the Water Emergency Transportation Authority and the Port of San Francisco
by ROMA Design Group in association with Moffatt & Nichol, Page & Turnbull, and CHS Consulting Group

MAY 17, 2011

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This report is the result of an eight month work effort which has included review and comments from stakeholders and citywide interest groups as well as WETA, the Port of San Francisco, BCDC and other regulatory agencies. The purpose of this report is to document the preliminary design concepts that have emerged from the process to date as well as relevant background information and analysis. The report includes concepts for the expansion of ferry facilities as well as public space improvements in the Ferry Building area and is being submitted for review and comment by the BCDC Design Review Board and the Port Waterfront Design Advisory Committee. Following this review and any additional public reviews, design refinements will be undertaken and an implementation strategy will be prepared. The implementation strategy will include construction cost budget estimates, potential funding and financing sources and responsibilities for construction and management between the Port, WETA and other stakeholders within the area. Subsequently, a Final Design Concept Plan will be prepared as the basis for environmental review and more detailed design and engineering efforts.

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Plan view of the Downtown San Francisco Waterfront, showing the existing ferry terminals at Gate B to the north and Gate E to the south

1. INTRODUCTION

The San Francisco Bay Area Water Emergency Transportation Authority (WETA) has embarked upon preliminary engineering and design for the Downtown San Francisco Ferry Terminal Expansion Project ("the project"). The purpose of the project is to expand and improve water-side and landside ferry facilities in the Ferry Building area. These facilities are designed in support of WETA's Implementation and Operations Plan (IOP) which calls for the addition of new routes and expanded ferry service as well as the coordination of emergency response on San Francisco Bay. This report describes the conceptual design for the phased build-out of the ferry terminal facilities (land and water) and for the improvement of adjacent public spaces. This report also includes background information and describes the context for change and earlier efforts for improvement of the Downtown Ferry Terminal area.

The project area, as depicted on Figure 1, extends from the south side of Pier 1 to the north side of Pier 14 and from the Embarcadero Promenade to the Bay. The site includes the landmark Ferry Building, which was built in 1898, and renovated in 2003 for a mixture of office and retail uses, as well as the Agriculture Building, which is also on the National Register of Historic Places, but still awaits rehabilitation and adaptive reuse. The Ferry Plaza, built by BART on the bayside of the Ferry Building in 1971, accommodates the existing BART and Golden Gate Ferry facilities, provides for a variety of open space, public access and service and delivery functions, and is the location of the vibrant Saturday farmer's market.

The project area also includes four ferry terminal berthing facilities. Gate B serves Tiburon and Vallejo; Gates C and D serve Sausalito and Larkspur and are operated by Golden Gate Bridge District and Gate E serves Alameda/Oakland and Harbor Bay. Gates B and E as well as the Pier 14 breakwater, the connecting promenades and public access areas were built by the Port of San Francisco in 2001-2003 as the first phase of the Downtown Ferry Terminal Master Plan prepared after the Loma Prieta earthquake disabled the Bay Bridge and focused new efforts on ferry ridership.

While the first phase of the Downtown San Francisco Ferry Terminal was undertaken by the Port of San Francisco, this phase of expansion is being undertaken by WETA. WETA (formerly WTA) is a local agency with multi-county jurisdiction which was created through Senate Bill 428 enacted in October 1999 to plan and operate new and expanded water transit service and related ground transportation for the San Francisco Bay Area. In October 2007, Senate Bill 976 replaced WTA with WETA and expanded WETA's duties to include the coordination of emergency activities of all water transportation and related facilities within the region, except those provided or owned by the Golden Gate Bridge District. This project is being undertaken by WETA in partnership with the Port, which holds the property in trust for the State and has land use and planning jurisdiction over it. A Memorandum of Understanding (MOU) was created between the two agencies to establish the partnership for implementing the design and environmental review of the project.

Figure 1: Project Area

Summary of Objectives

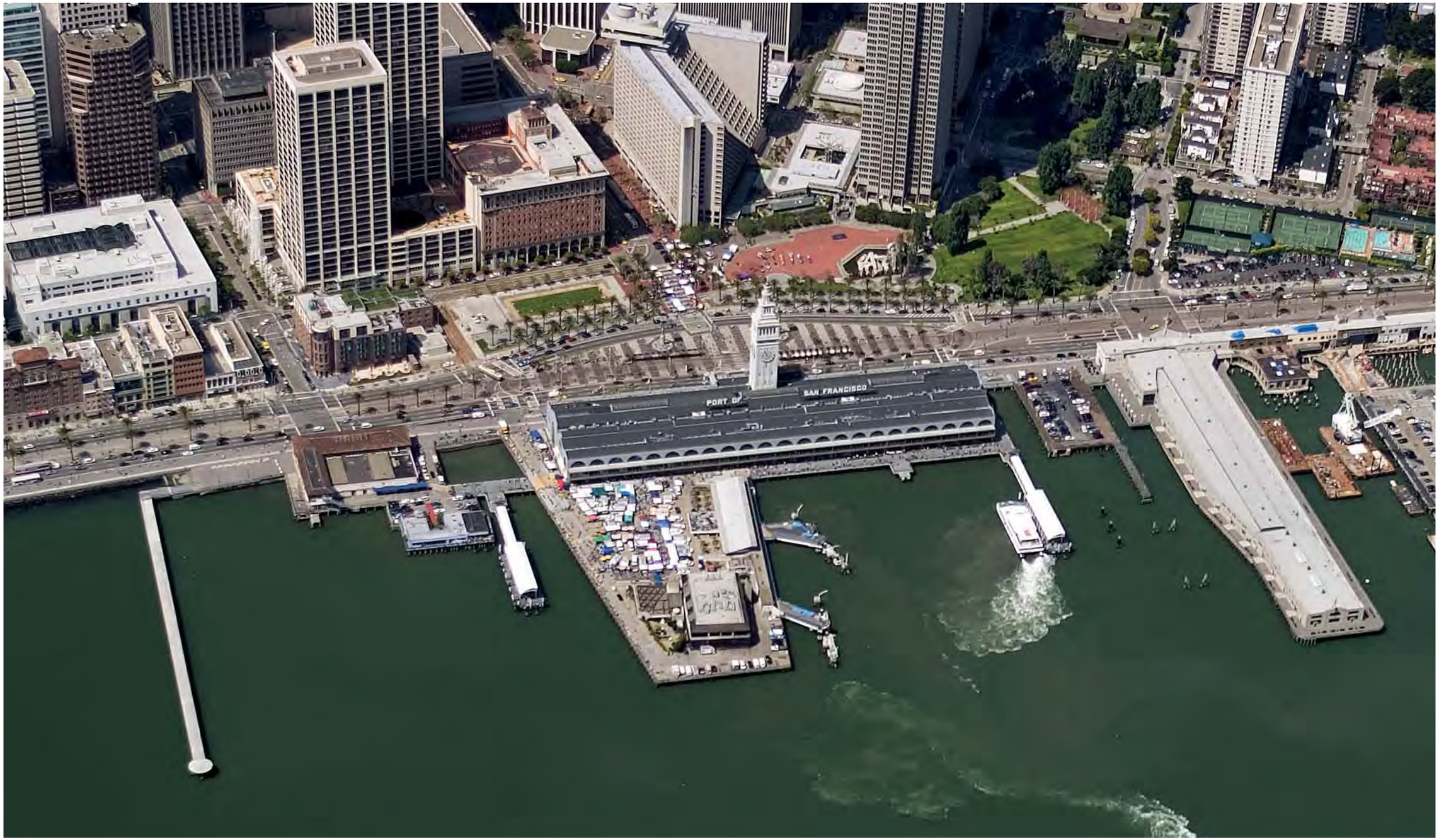
A number of objectives have been articulated for this phase of the Downtown San Francisco Ferry Terminal Expansion Project. These fall naturally into two groups – the first related more specifically to WETA's responsibilities for the development of the ferry terminal facilities and the second, having to do with the larger land use and ownership responsibilities of the Port.

1. ***Enhance ferry ridership and strengthen the role of the area as the waterborne transit hub of the city and region***

- Expand waterborne transit service
- Provide adequate space for queuing and waiting
- Enhance passenger amenities and weather protection
- Improve intermodal connections
- Provide for disaster emergency response needs

2. ***Enhance the economic viability and role of the area as a significant gathering place in the city***

- Enhance opportunities for future Ag Building rehabilitation
- Remove dilapidated and substandard structures
- Improve the usability and quality of public spaces
- Improve activity linkages and commercial recreational potential
- Provide for pedestrian, bicycle and vehicular circulation



View to Downtown Ferry Terminal and Mid-Embarcadero (May 2005)

2. EXECUTIVE SUMMARY

The Downtown San Francisco Ferry Terminal Expansion Project is intended to provide additional ferry berthing capacity for commuter service and emergency response. WETA provides an important and additional means of meeting the unmet demand for transit service and for the relief of traffic congestion. Water transit today is a small but growing part of the Bay Area's transportation network. While it carries only a fraction of the total Bay Area travelers, approximately 5 million trips per year, water transit plays a meaningful role in reducing congestion and providing mobility in the key transbay bridge corridors.

The Downtown Ferry Terminal currently accommodates 6 ferry routes totaling 130 ferry arrivals and departures each day. It is projected by 2025 to serve 34,900 riders, a 204 percent increase over current ridership levels of 11,487 riders, accounting for existing plus planned ferry services between San Francisco and Berkeley, Richmond, Hercules, Treasure Island, Martinez, Antioch and Redwood City (CSI, 2005). Revised and updated ridership projections are currently being undertaken by Cambridge Systematics (CSI) on behalf of WETA and are expected to be available in the Spring of 2011.

The four gates in the Downtown Ferry Terminal provide for 20 peak period arrivals (6:30 to 9 AM). Two of the terminals (Gates C and D) are used exclusively by Golden Gate Ferry. The remaining gates (B and E) accommodate 14 vessels during the peak period. The number of non-Golden Gate Ferry vessels in the peak period is expected to increase to 39 peak period arrivals by 2025. In addition to the anticipated demand for vessel arrivals based on projected routes and ridership, there is the need to accommodate a disabled or visiting vessel as well. It is not possible to serve the projected demand without the addition of new ferry terminal facilities.

Today within the project area, as shown in Figure 2, there is adequate space for one additional berth (Gate A) in the North Basin and two additional berths (Gates F and G) in the South Basin. In order to minimize crossover traffic, Gates A and B would best serve the North Bay routes – Vallejo, Tiburon, Berkeley, Richmond, Hercules, Antioch and Martinez. Gates E, F, and G would best serve the Central, East and South Bay routes – Treasure Island, Alameda, Oakland, Harbor Bay and Redwood City. Additional evaluation was undertaken and it was determined that Gate E would be the optimum location for the new Treasure Island service and that Gate F would then be needed to accommodate Alameda, Oakland and Harbor Bay, which is currently located at Gate E. Gate G could accommodate additional South Bay routes, such as Redwood City, and/or can be used as a spare berth. In addition to expanded and improved berthing facilities, there is also a need for improved and additional space for waiting, queuing, and circulation and public access. Furthermore, it is highly desirable to provide weather protection which defines distinct queuing areas, facilitates boarding and provides a location for real time information. In addition, clearly identifiable pedestrian pathways with wayfinding signage are required to further enhance the rider experience.

Beyond the need for ferry terminal expansion to meet existing and projected commuter demand, there is also the need for ferry service when unexpected and long-term disruption renders other components of the regional transportation system inoperable. Disastrous events that have disrupted the transportation system have occurred several times over the past 25 years and most recently in 1989 when the Loma Prieta earthquake damaged the Bay Bridge. In the Ferry Building area, it is estimated that WETA facilities can provide transportation services during the response phase of a disaster for up to 10,800 passengers per hour, based on the assumption that all five terminals are available and that Gate E is utilized for bow-loading vessels.

Although existing backland areas associated with Gates B and E were built to "essential structure" status in Phase 1 by the Port, additional staging areas will be required to assemble, queue and board crowds for emergency evacuation as well as for daily commuter waiting, queuing and circulation. It is estimated that approximately 13,000 square feet of new and replacement fill will be required in the North Basin, after the demolition of Pier ½, and in the South Basin, approximately 29,000 square feet of new and replacement fill will be required after demolition of Pier 2. This includes the filling of the existing lagoon which currently constrains access and circulation to the ferry terminals as well as the replacement of substandard deck and pile construction generally between the Ferry Building and the Agriculture Building.

The concepts for ferry terminal expansion have also been developed in consideration of the way in which they can support the larger role of the area as a significant gathering place in the city, and reinforce the activities and functions of the landmark Ferry Building. Concepts have also been developed for how the existing and future open space qualities can be enhanced, how activity linkages can be improved and how pedestrian circulation and public access opportunities can be best achieved. Although the restoration of the Agriculture Building is not a part of this project, a great deal of care has been given to make sure that the expansion of the facilities and the open space and public access improvements will serve to enhance its future potential.

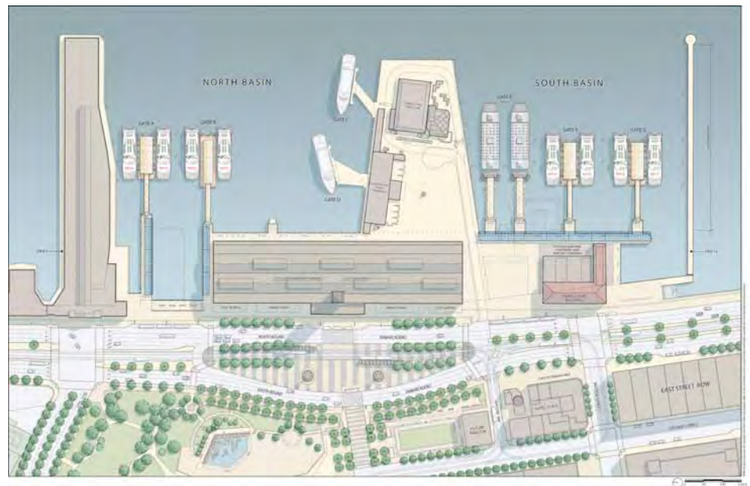


Figure 2: Phase 3 Plan (2020 - 2030)

Damage inflicted by the earthquake, 1906.

Pedestrian and vehicular traffic along the Embarcadero, 1924

Looking south on the Embarcadero at the Ferry Building, 1915

View of historic intermodal terminal, showing the vehicular subway, the transit turn-around and the elevated pedestrian bridge and multiple ferry slips, 1930s.

Ferries arriving at the Ferry Building in the early years of the 20th century before the Bay Bridge was built.

3. CONTEXT FOR CHANGE

The Ferry Building area is one of the most historically significant areas on the San Francisco waterfront and in the City of San Francisco. It is an area that has undergone significant change in physical character and meaning over time. From our vantage point today, three significant and distinctive historic eras characterize the history of the Ferry Building area. The first dates back to the late 1890's when the shoreline was established and the waterfront was the scene of intense activity; the second came into being with the building of the bay bridges and the subsequent decline of the ferries; and the third marks the period we are in today, with water transit on the rise and the area experiencing renewal and reconnection with the city.

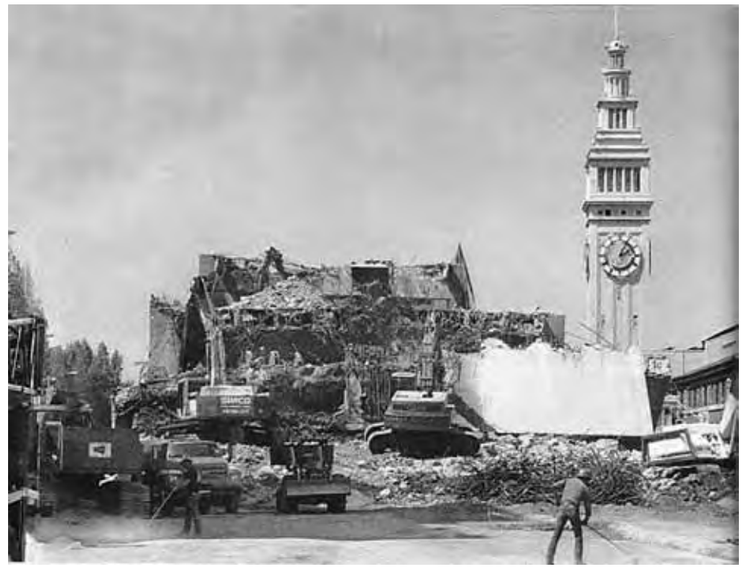
The first milestone era came about at the end of the 1800's and extended into the early decades of the 20th century when the waterfront was characterized by rapid and intensive change. The shoreline advanced bayward towards deep water through filling. Piers were extended as city streets, with filling on either side until the Great Seawall was finally built in 1896, establishing a permanent shoreline for the city. Immediately following the construction of the Great Seawall, the Ferry Building was built at the foot of Market Street and within a short period of time became one of the busiest transportation terminals in the world, second only to Charing Cross Station in London. By 1930, the Bay Area's population was only a quarter of what it is today but 250,000 passengers traveled through the Ferry Building each weekday for a total of 50 million passenger trips per year.

During these years, the area around the Ferry Building changed numerous times. Buildings were added, modified and/or taken away on the north and south sides of the building. On the bayside of the Ferry Building, docks and wharves were continuously modified, expanded and rebuilt to accommodate the ferry system and buildings and sheds crowded along the Embarcadero and directly adjoined the Ferry Building to the north and south. Ultimately, overhead pedestrian bridges, underground vehicular tunnels and transit turnarounds were added to organize the demand and intensity of transportation movement and connections from land to water.

Although originally designed to be 200 feet longer than it is today, the 660-foot length of the Ferry Building gave it singular prominence on the Embarcadero and within the city. Few other buildings adjacent to it could begin to compare with its civic stature and importance. The only exception during this era were the early post office buildings, which were significant structures owing to the importance of the location and the fact that almost all communications from the outside world entered San Francisco by water. First, a Romanesque structure was built to the south of the Ferry Building for this purpose, but it was replaced in 1915 by the Ferry Station Post Office which, when it was reassigned to the Department of Agriculture in the 1930's, became known as the Agriculture Building.

Arriving by ferry to the downtown San Francisco waterfront, 1929

Bay Bridge under construction, 1935

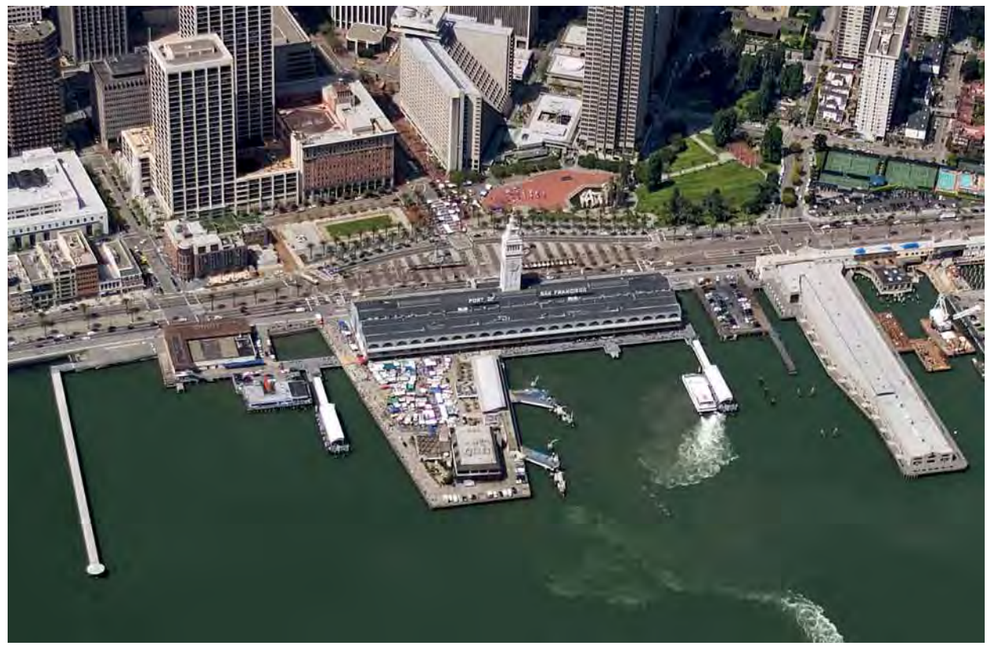


Embarcadero Freeway under demolition, 1991

The Ferry Building area isolated from the downtown by the Embarcadero Freeway.

The Ferry Building and Harry Bridges Plaza, improved after removal of the Embarcadero Freeway.

Long view of the Embarcadero before removal of the freeway.



After implementation of landside and waterside improvements.

The Agriculture Building experienced significant modifications over its history. Additions were built and the structure was jacked up to repair the seawall in 1925. The Mediterranean style building was originally two stories in the front and one-story in the back, with a second-story added to the west side of the building in 1918. Today, it is individually listed in the National Register of Historic Places for local historical and architectural significance and is significant for its association with the centralization of San Francisco's postal services and also as an example of an early 20th century Mediterranean style government building. Its historic period of significance is 1915 to 1925. Additionally it is a contributor to the San Francisco Embarcadero Historic District (2006). But, unlike the Ferry Building which is also a contributor to the district and individually listed in the National Register of Historic Places, the Agriculture Building has not undergone recent rehabilitation and preservation efforts and is in poor condition, susceptible to periodic flooding and potential damage or destruction in a major seismic event.

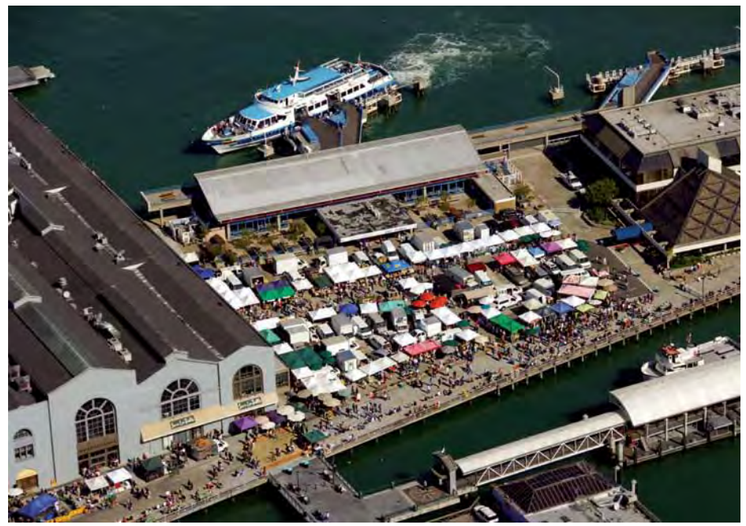
The second major milestone era in the history of the waterfront came after the construction of the Bay Bridge and Golden Gate Bridge in 1936 and 1937 and with the advent of the automobile age. During this period, ferry service declined to the point that in the 1950's it no longer served the Ferry Building nor the San Francisco Bay area as a whole. Buildings and sheds adjacent to the Ferry Building and ferry slips began to be removed, and by the 1940's, the streetcar turnaround at the base of the Ferry Building was eliminated along with overhead and below grade crossings. No longer a major cross-roads of movement and center of activity, the waterfront began to decline and soon became seen as an expedient location for functions that served other parts of the city at the expense of the waterfront itself. Ultimately, the Embarcadero Freeway built in 1959 cut off the waterfront from the city without providing access to it. The waterfront became a place to move through on the way somewhere else rather than as a destination in itself. During this time, the Ferry Building diminished so greatly in importance that consideration was given to its removal and a number of plans were submitted for alternative use of the site. Although the building remained, it underwent many ill-conceived remodels that compromised its historic integrity and stature. The ferry slips continued to be removed and in 1971, the BART Ferry Plaza Platform and Transition Structure, was constructed as part of the Transbay Tube connection to the East Bay. This platform also became the location for the Golden Gate Ferry Terminal which was established to mitigate growing traffic congestion on the bridges.

The third major milestone era was initiated in the early 1980's when the city began to turn its attention to the opportunities for redevelopment along the Northeastern Waterfront. A new vision emerged for a waterfront reintegrated with the city, with the Embarcadero playing an important role in pedestrian, bicycle and transit as well as for recreation and public access to the bay. But, this vision was not realized until the 1989 Loma Prieta Earthquake damaged the Embarcadero Freeway and the decision was made not to rebuild it. After the removal of the freeway, a number of major initiatives were undertaken to realize the potential that had been envisioned for this area. The Mid-Embarcadero Transportation and Open Space Project rebuilt the Embarcadero Roadway as a mixed mode boulevard and helped to reorient and reconnect the cityfront to the waterfront. The first phase of ferry terminal improvements which were undertaken by the Port of San Francisco, built new terminals and created the basis for future ferry terminal improvements. It also improved pedestrian access to the new ferry terminal facilities and, in conjunction with the preservation, rehabilitation and adaptive reuse of the Ferry Building, created activities and linkages that brought new meaning and vitality to the area.

The Downtown San Francisco Ferry Terminal Expansion Project comes on the heels of previous efforts and it is important to recognize that it is a part of a continuum of change and improvement that is part of the renaissance and rebirth of the waterfront. In order to understand where we are and where we go from here, it is necessary to also understand the issues, options and considerations that helped shape the decisions that preceded the current project.

Waterside of the Ferry Building showing areas obstructed by the mechanical room.

The Bayside Promenade after restoration of the Ferry Building.



The location of the farmer's market on the Ferry Plaza brings activity and life to the area.

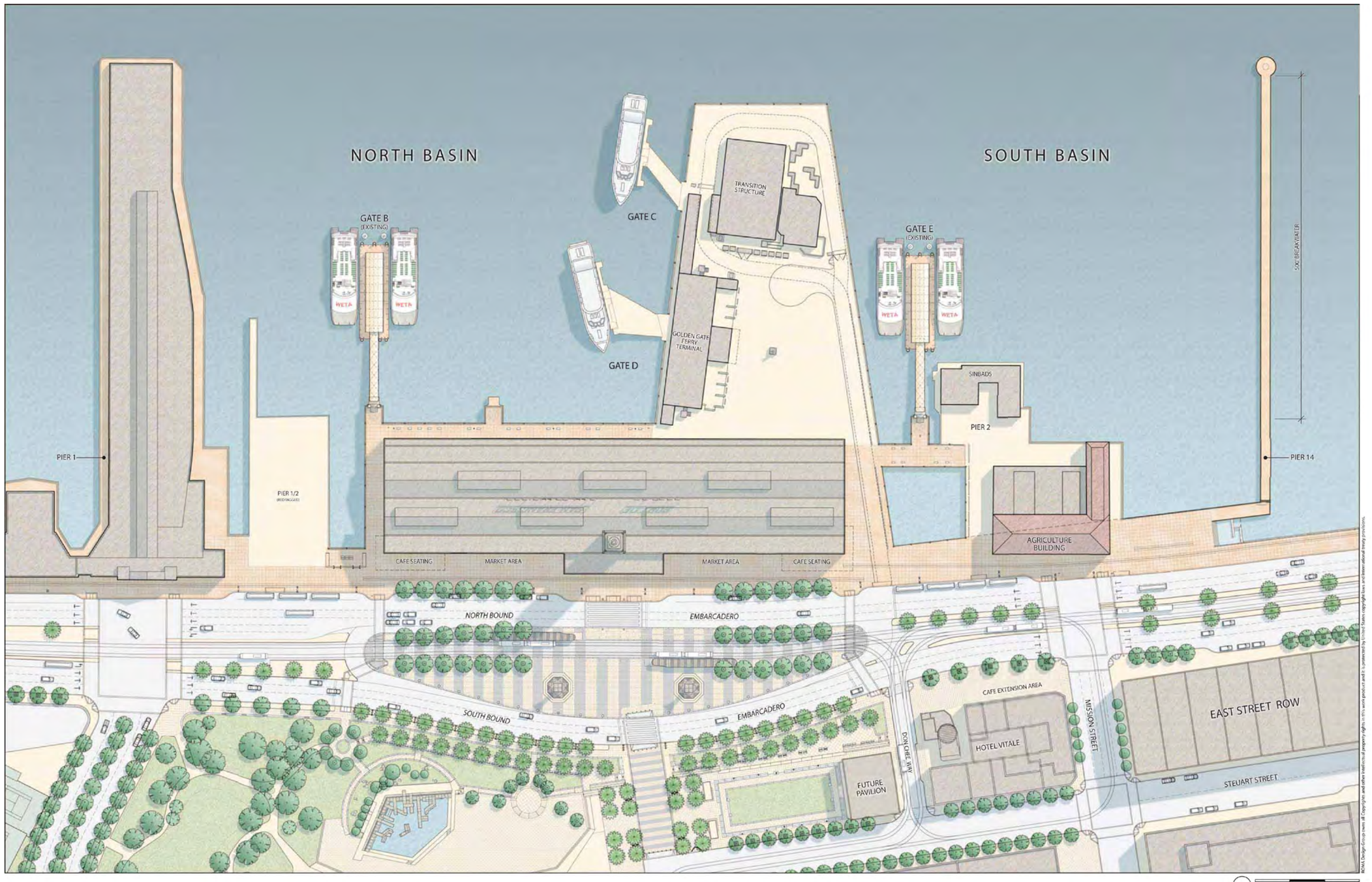


Figure 3: Downtown Ferry Terminal: Phase One, Completed 2001 - 2003

4. SUMMARY OF PHASE ONE EFFORTS

The Downtown San Francisco Ferry Terminal Project was undertaken following the 1989 Loma Prieta earthquake, when ferry services were quickly expanded to address commuter issues with the closure of the Bay Bridge. Subsequently, because of the success of these services, additional funding was made available to implement more permanent facilities in the Ferry Building area. Although this initial phase of development was limited in funding for capital improvements, there was a desire to consider not only what to build in the near term, but also the long term ferry terminal development potential and how the ferry terminal could complement other objectives for the revitalization of the Ferry Building and the surrounding area.

The Phase 1 effort (shown in Figure 3) was also undertaken in conjunction with two other major initiatives. One was the implementation of transportation and open space improvements in the former right-of-way of the Embarcadero Freeway (the "Mid-Embarcadero Transportation and Open Space Project") and the other was the pursuit of the historic preservation and adaptive reuse of the Ferry Building. Each of these projects contributed to the remaking of the area and the opportunities and challenges that present themselves today.

In developing the plans for the Phase 1 project, regional travel demand forecasts developed by the Metropolitan Transportation Commission (MTC) were augmented by on-board surveys of ferry riders and input from captains and operational managers of existing ferry routes. In addition, consultant input in coastal engineering, architecture and planning and a variety of technical fields was provided as well as input from the Port of San Francisco, City agencies, Bay Conservation and Development Commission (BCDC) and adjacent community groups and stakeholders. A number of alternatives were considered, evaluated, screened out or developed further related to functional, organization and transportation aspects of the Ferry Terminal.

Fixed versus Floating Terminals

Fixed terminals are utilized by Golden Gate Ferry in San Francisco and are used extensively in the Pacific Northwest for larger vessels. They require hydraulic ramps and other facilities that can adjust to tidal variation, but are not generally adaptable to a variety of vessel types. In the Bay Area, floating terminals that require a gangway and a float that can more readily accommodate tidal variation, seawall height and the diversity of vessels that characterize the Bay Area fleet are more commonly used. Early on in the development of the Phase 1 effort, it was determined that floating terminals would be utilized for the flexibility, diversity and more straightforward maintainability.

Alternative Berthing Configurations

A number of locational options for berthing within the Ferry Building area were evaluated both for meeting the immediate needs and long-term ferry terminal potentials. One of the alternatives considered was to keep all of the berths on the north side and rebuild Pier ½ to provide access to them. Another option was to split the terminals and locate one on the north and one on the south side of the Ferry Building. The concept of a North and South Basin (as depicted in Figure 4) was selected because it provided for a distribution of the routes which would minimize crossover traffic. It also created an organization that allowed greater benefit to the entire area as well as better landside accessibility.

Once the decision was made to locate ferry berthing to the north and south of the Ferry Building, further consideration was given to the location of a new terminal directly off of the south end of the Ferry Plaza, mirroring what Golden Gate had built to the north, or to organize the new terminal perpendicular to a north/south axis paralleling the Ferry Building as historically the ferry terminals were located. Ultimately, the advantages of the north/south organization was selected not only for the benefits it offered for navigation and wind/wave conditions but also because it provided greater

Figure 4: Ferry Terminal Concept for Creating a North and South Basin

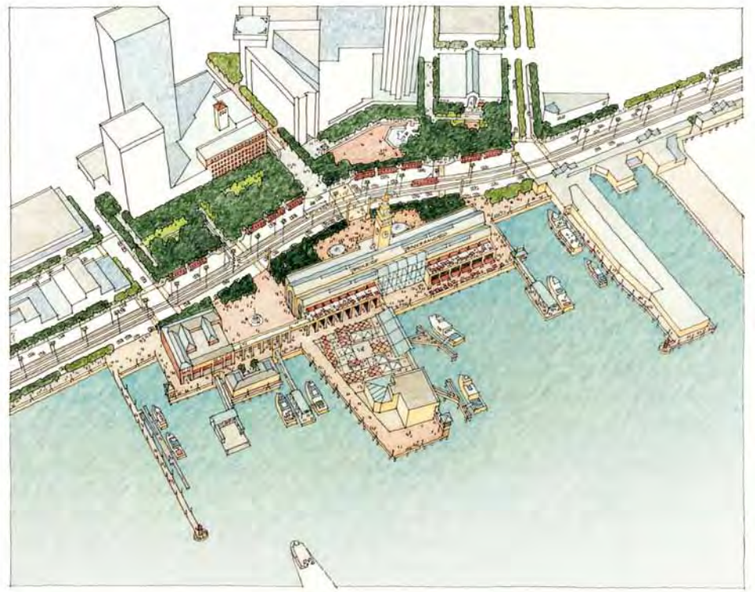


Figure 5: Illustrative Concept Developed as Part of the Phase 1 Efforts

flexibility for future expansion. As part of this first phase of development, a new Gate B was proposed for the area just north of the Ferry Building to serve Vallejo and Tiburon ferries and a new Gate E just south of the Ferry Building and the BART platform was proposed to serve the Alameda/Oakland and Harbor Bay Isle ferries. In addition, the plan located a potential gate south of Pier 2 or Sinbad's Restaurant, for Hovercraft which was being discussed for service to the airport (see Figure 5). Ultimately, this service was not implemented and the gate was not implemented as a part of Phase 1 of the project. However, the concept of four total gates to the north (including Golden Gate ferries) and three to the south were considered for the long term development of additional ferry routes as demand warranted.

Alternative Breakwater Configurations

In developing the concept for a new South Basin that complemented the existing North Basin, where the Golden Gate and Vallejo ferries were located, it was determined that additional protection from the southeasterly storm-driven wind/wave conditions would significantly benefit ferry operations. A variety of breakwater alternatives were developed and evaluated, including a closer-in breakwater that would be located just south of the Agriculture Building and a more extended breakwater that would be extend from the end of Howard Street. In addition, for both alternatives, sub-options were considered that provided for the extension of arms which enveloped the basin in a variety of shapes. Trade-offs between the amount of protection afforded versus the navigational constraints created by the breakwater as well as fill, public access and visual considerations were taken into account in the ultimate decision to proceed with a straight 500-foot breakwater at what is now Pier 14 with an open landside segment to allow flushing and reduce siltation. Figures 6 - 8 illustrate some of the alternatives that were explored for a providing sheltered ferry basin on the south side of the Ferry Building.

Pedestrian Circulation

Surveys conducted at the time concluded that 63% of ferry patrons arriving in San Francisco walked to their destinations; 17% used transit and the remainder take taxis or are picked up by private auto. The surveys also indicated that the vast majority of commuters crossed the Embarcadero at Market Street to walk to their destinations or to take transit or taxis. The major problem regarding pedestrian circulation at that time were the obstacles created both by the freeway and when the freeway was removed, by the "no man's land" between the Ferry Building and Justin Herman Plaza. In addition, the Ferry Building itself posed a significant obstacle to pedestrian circulation. Access through the building was limited to one narrow corridor on the south wing and the bayside connections were non-existent.

A critical circulation improvement that needed to be undertaken at that time was the opening up of the bayside promenade that had been fenced off and occupied by mechanical equipment and service functions. In addition, the connection through the building from Market Street to the bay did not exist and needed to be established. Furthermore, the historic passages in the north and south wing also needed to be re-established to provide additional circulation. All of these improvements were called for in the Phase 1 master plan for ferry terminal development and were subsequently implemented with the historic renovation of the Ferry Building. In addition, when the Ferry Building was restored, a new concept for a ground level central nave extending north/south through the entire building was created.

Additional pedestrian and public access improvements were also needed on the north and south side of the Ferry Building as well to more directly connect to the new ferry terminals at Gate B and Gate E. As part of the first phase of ferry terminal improvements, a new 28-foot pedestrian promenade to Gate B was built just north of the Ferry Building and a new connection from the BART platform southward was also constructed to Gate E. Both of these were built as "essential structures" so that they would provide access even after a major seismic event.

In order to facilitate the crossings of the Embarcadero, improvements needed to be made to Market Street, which, with the freeway, had been de-emphasized as an important connection. Improvements were also needed to create new and improved crossings to the north and south of the Ferry Building. The space just west side of the Ferry Building, which was utilized at that time for pull-in parking, needed to be reclaimed for pedestrian circulation, queuing areas for pedestrian crossings and for the extension of active ground level uses which would help to create a more vibrant public realm. These improvements were implemented, to the greatest extent, as part of the Mid-Embarcadero Transportation and Open Space Project and were reinforced with the redevelopment of the Ferry Building.

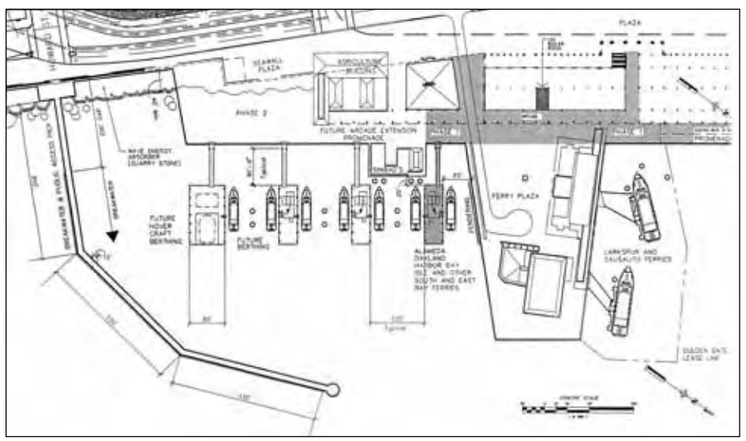


Figure 6: Howard Street Elongated Breakwater Option

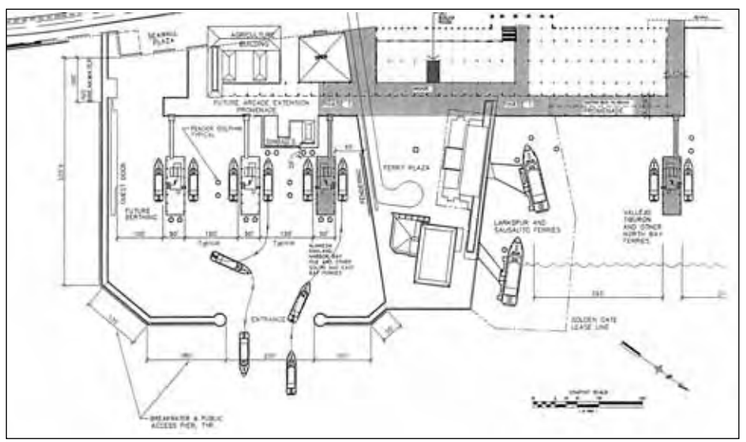


Figure 7: Pier 14 Extended Dual Arm Breakwater Option

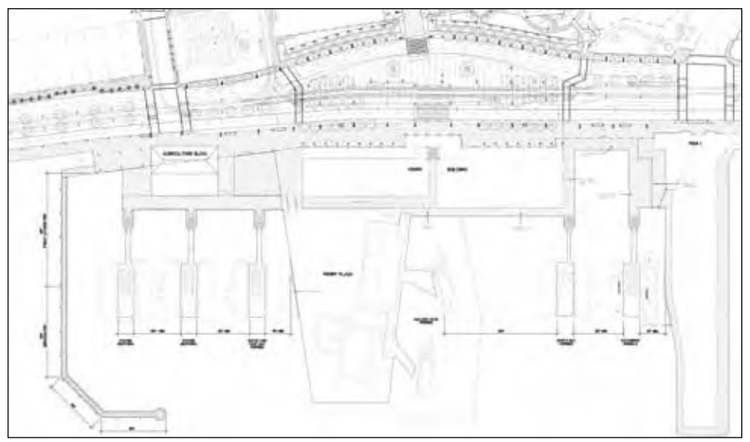
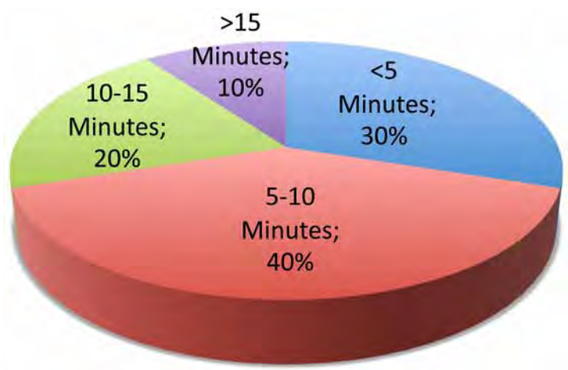


Figure 8: Pier 14 Single Bent Arm Breakwater Option

Bus/Taxi/Auto Drop-Off

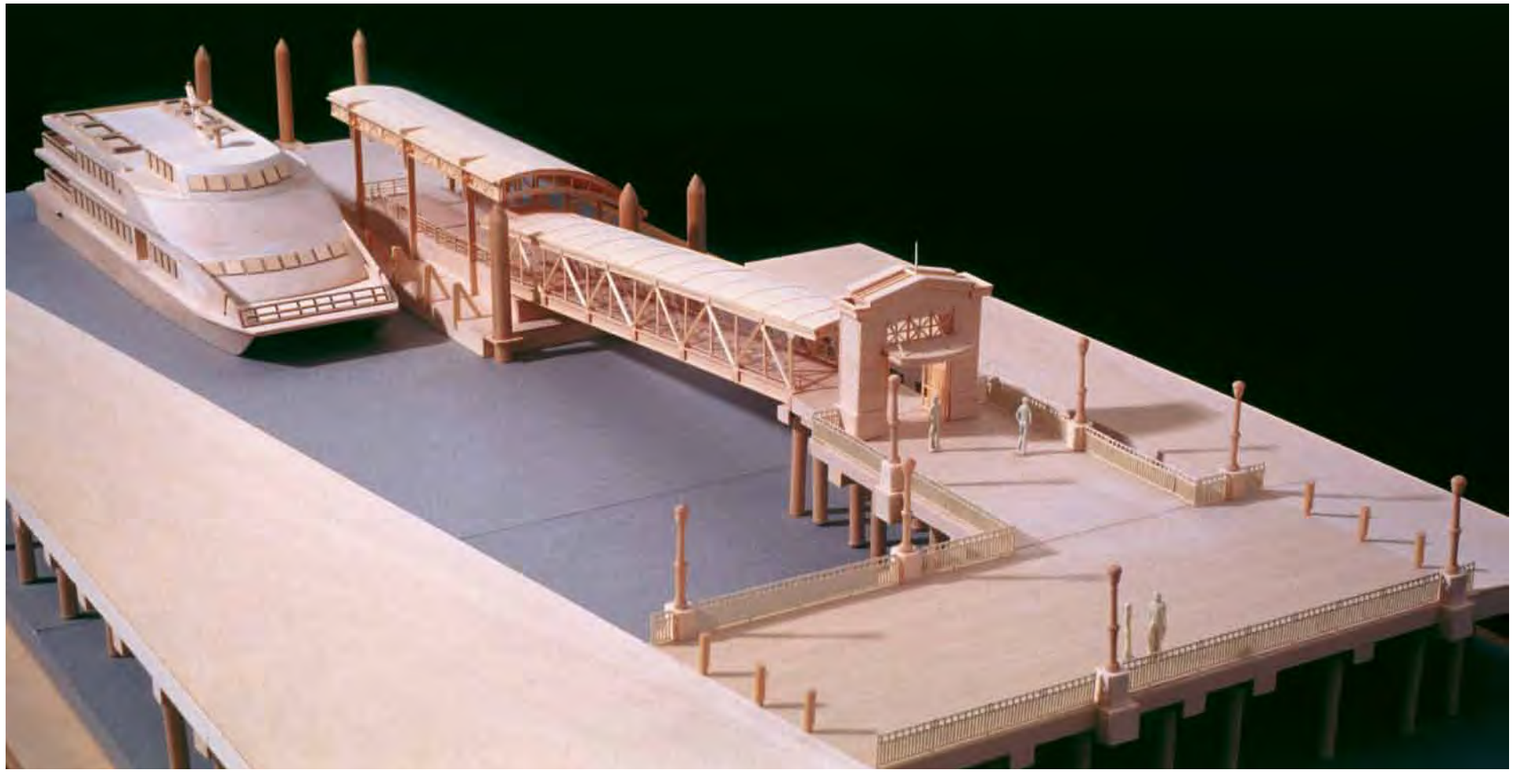
Consideration was also given to additional bus/auto/taxi drop-off areas, which primarily are located on the west side of the Embarcadero. Options included locating drop-off in front of the Ferry Building and to the north along Pier ½ and to the south to the Agriculture Building. In addition, options were considered to rebuilding Pier ½ and filling the lagoon south of the Ferry Building for these functions. Both filling the lagoon to the south and rebuilding Pier ½ to the north were not pursued due to regulatory constraints limiting fill for parking and vehicular functions.

Vehicular drop-off functions already existed on the Ferry Plaza and it was recognized that some of these functions would continue to be required along with service delivery and truck loading as part of the Ferry Building restoration. However, it was also determined that bus service would create conflicts without providing significant benefit. Except for Golden Gate buses, which met the Golden Gate ferries and AMTRAK which was located at the Ferry Building, all other bus service providers preferred remaining on the west side of the Embarcadero in their current locations, where reasonable headways and more efficient service could be provided. As a result, no new drop-off areas over water were pursued and only curbside drop-off was to be retained and was implemented on the Embarcadero on either side of the Ferry Building tower as part of the Mid-Embarcadero Transportation and Open Space improvement program.



Surveys undertaken in 1991 indicated that 65 to 70% of commute ferry passengers access the ferry boarding area within ten minutes of the scheduled departure time. Only about 10% arrive more than 15 minutes in advance of departure. Nelson Nygaard.

Figure 9: Previous Ferry Rider Survey Results



Phase 1 Model of Gate E Improvements

Passenger Amenities

With the type of ferry service that historically existed, passenger queuing, waiting, ticketing and weather protection was provided within the Ferry Building, primarily on an upper level. The Golden Gate ferries operated by the Bridge District had constructed a ferry terminal to the east of the Ferry Building that included both ticketing and passenger waiting areas. Consideration was given, in this early phase of ferry development, as to how to most appropriately provide for these functions with the diverse and smaller vessels that serve the existing routes and would probably serve future routes as well. In discussions with operators and based on passenger surveys, it was determined that a specialized facility with centralized waiting areas was not desirable. Smaller vessel sizes, decentralized and on-board ticketing and the arrival of commuter passengers just before departure (see Figure 9) and line up in front of the gate rather than assemble in groups, a less centralized approach was considered to be more appropriate. A linear, covered area directly associated with each of the ferry terminal gates, allowing passengers to queue in an orderly manner with some level of weather protection, was considered to be the most desirable. A variety of options were sketched out, including an independent, covered arcade along the bay, or canopy extensions from the existing Ferry Building in a variety of manners. In addition, in reviewing the then-condition of the Ferry Building, consideration was given to the potential role of the arcade that still remained on the south wing and to restoring the one that was filled in on the north wing for this function. Due to funding limitations and the anticipated renovation of the Ferry Building, the ferry terminal project itself did not pursue any of these options. Although the Ferry Building renovation project ultimately did provide the movement areas within the building which could be utilized by ferry patrons and a larger public room for waiting, weather protection and queuing areas directly associated with the gates were not pursued. These are now a consideration for the current phase of ferry terminal development.

Extent of Improvements. *Following the removal of the Embarcadero Freeway, a number of improvements were made, including the first phase ferry terminals, including Gates B and E and the breakwater at Pier 14, as well as the Bayside and Embarcadero Promenades, public space improvements, and transit, bicycle and pedestrian improvements along the Embarcadero Roadway.*

Linkages that have been made. *From 2001 to 2003, a number of connections were made within the area, including the improvement of the north/south connection along the Embarcadero, the creation of a Bayside Promenade, new pedestrian crossings of the Embarcadero, and linkages within and through the Ferry Building to the waterfront.*

Long-term leaseholds *comprise much of the area immediately adjacent to the Downtown Ferry Terminal. They include property leased from the Port of San Francisco by the Equity Office (the Ferry Building), Golden Gate Bridge District (Gates C and D and adjacent water area), Ferry Plaza Limited Partnership (restaurant associated with the BART Transition Structure) and AMB at Pier 1.*

Deck and Piles in Poor Condition. *In the North Basin, this includes Pier ½ that was red-tagged and removed from surface parking use in 2010. In the South Basin, this includes Pier 2 and Sinbad's as well as the substructure of the Agriculture Building, identified by the Port as being in poor condition.*

Improved linkages that are needed. *The linkages that still need to be made are shown in yellow and include the completion of the Bayside Promenade all the way along the waterfront, between the Agriculture Building and Ferry Building as well as extensions of the north/south circulation route through Ferry Building.*

Port of San Francisco Embarcadero Historic District. *The Historic District includes the Embarcadero Promenade, Pier 1, and the landmark Ferry Building as well as the Agriculture Building. The ferry terminal improvements are adjacent to but not within the Historic District.*

5. OPPORTUNITIES AND CONSTRAINTS

This chapter summarizes the existing site context, the changes that were previously undertaken and the constraints and opportunities for additional improvements related to the Ferry Building area as a whole. The graphics on the facing page depict both the improvements that were made following the 1989 Loma Prieta Earthquake and the removal of the Embarcadero Freeway and, at the same time, summarize the need for additional improvements. For example, the earlier improvements resulted in a number of new and restored pedestrian linkages, both within the Ferry Building area and from the waterfront to the city. But, additional improvements are still needed. North of the Ferry Building, the deck and piles associated with Pier ½ are in poor condition and in fact the area is currently red-tagged and fenced. On the south, Pier 2 and the Agriculture Building are also in need of significant rehabilitation efforts. Additional enhancements for pedestrian and public access are needed both for future ferry terminal development as well as for the betterment of the area as a whole.

In planning for the future, it is also important to note that there are long-term leases on significant portions of the Ferry Building area as well as significant historical resources within it. The Ferry Building, the Agriculture Building and the Embarcadero Promenade are part of the Port of San Francisco Embarcadero Historic District. The areas that offer the greatest opportunities for expansion of ferry facilities and linkages that will serve the ferry terminals are least constrained by long-term leases and are also outside the Historic District. However, the conceptual design for the expansion of the ferry terminal facilities needs to consider the adjacency to the historic resources and the requirements of the long-term lease-holders.

Sea level rise is a new and important consideration affecting the entire waterfront. Here, it will require a response that is fitted to the unique urban setting of the downtown waterfront and its historically significant context as well as the investments that have been made in existing major infrastructure and urban development. Furthermore, what is clear is that the science of climate change and sea level rise is evolving and prudent solutions are required that respond to the context appropriately.

In terms of the Downtown Ferry Terminal area, it is fortunate that the ground floor of the Ferry Building is already built to an approximate elevation of 11.8 feet (MLLW), which accommodates three feet of sea level rise above the 100-year storm event of 8.7 feet. The ferry terminal at Gate B was built at an elevation of 11.4 MLLW and the ferry terminal at Gate E was built at 11.76 feet MLLW to provide adequate slopes for drainage and to conform to the elevational context of the Ferry Building. Future ferry terminals should be constructed as high as possible in recognition of the flood hazards and the coastal and sea level rise considerations, however, they will also need to conform to existing conditions that cannot be changed and provide adequate slopes to meet drainage and ADA accessibility requirements.

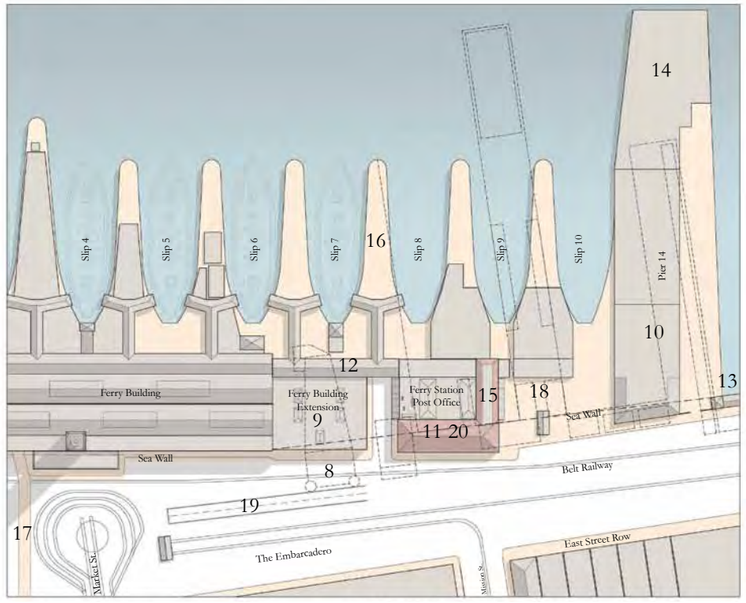
Currently, problems of flooding affect the area around the Agriculture Building, which is much lower than elsewhere within the Downtown Ferry Terminal site. The finished floor elevation of the Agriculture Building is around 9.5 feet MLLW and the southwest corner of the apron adjacent to it is 9.25 MLLW. In recent years, the building has on occasion flooded when a high tide and storm surge coincide and recent analysis of the Federal Emergency Management Agency (FEMA) has mapped the Ag Building and a small portion of the adjacent wharf as a Special Flood Hazard area. As part of future restoration and adaptive reuse, the finished floor of the Agriculture Building will need to be raised to respond to these parameters. It is interesting to note that the Agriculture Building was previously raised in 1925 to repair the Great Seawall.

In the Phase 1 efforts, great care was given to how the new ferry terminal improvements would relate to and enhance the potential of the Ferry Building development, which had not yet occurred. In this phase, the same kind of attention needs to be given to the Agriculture Building and the way in which the ferry terminal improvements could be accomplished in a manner that would help to enhance its future potential. The Agriculture Building project is not a part of this ferry terminal expansion program just as the Ferry Building was not a part of the Phase 1 effort and its restoration and adaptive reuse will be undertaken by the Port of San Francisco

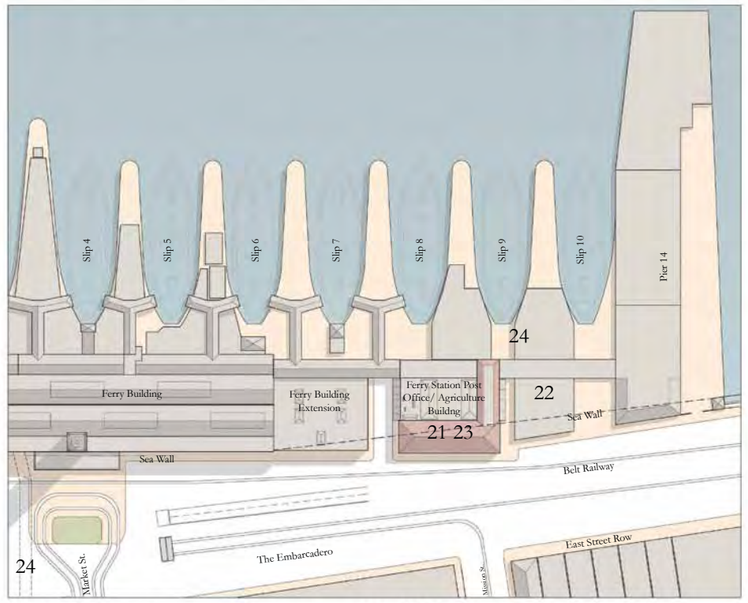
High tide during storm on February 14, 2011

when the development market and the Port's financial resources warrant the investment. Further, as shown in Figure 10, the historic context of the Agriculture Building is one of intense ferry terminal building and deconstruction that occurred over the past century.

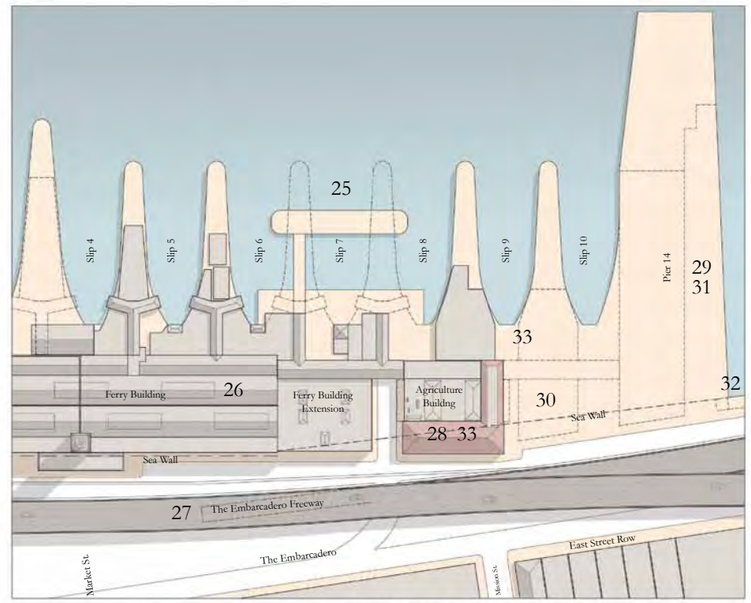
Additional investigations have been undertaken, however, to determine that ferry terminal expansion would enhance and not preclude the opportunity for the future restoration and adaptive reuse of the Agriculture Building. A preliminary grading concept, as indicated in Figure 11, demonstrates how the finished floor elevation of the building could be elevated to a similar elevation as the Ferry Building with surrounding walkways, promenades and plazas graded for drainage and accessibility and to conform with existing grades along the Embarcadero, while elevating the new ferry terminals to a finished floor elevation of approximately +12 MLLW. The isometric drawing shown in Figure 12 illustrates how the building might be elevated, preserving those aspects which contribute to its historic significance while allowing infill where appropriate.



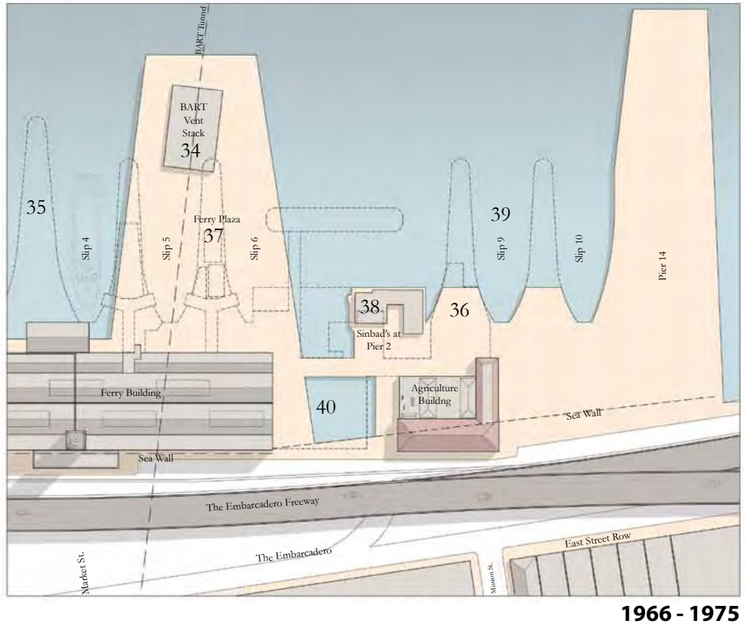
1915 - 1925



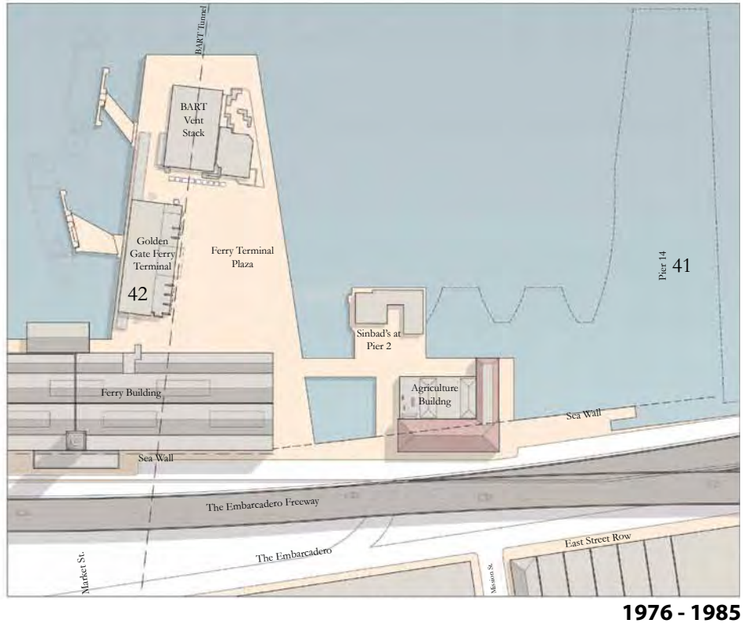
1926 - 1945



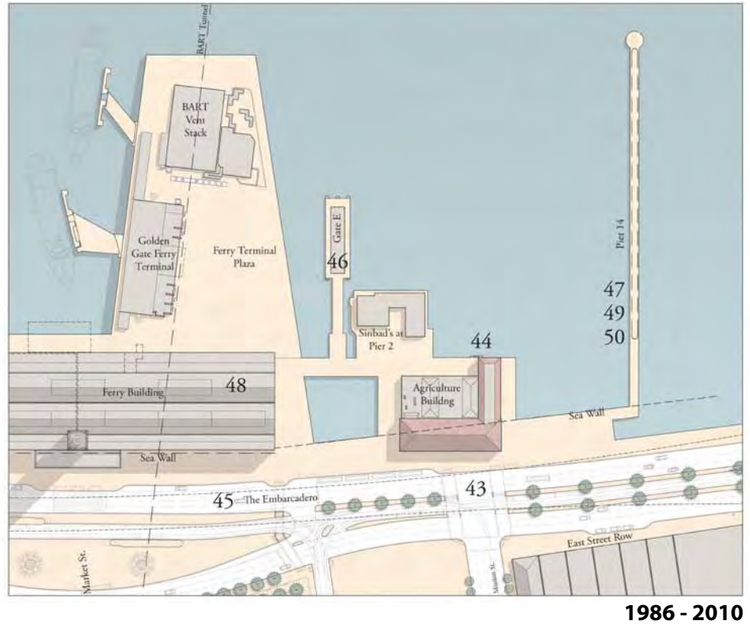
1946 - 1965



1966 - 1975

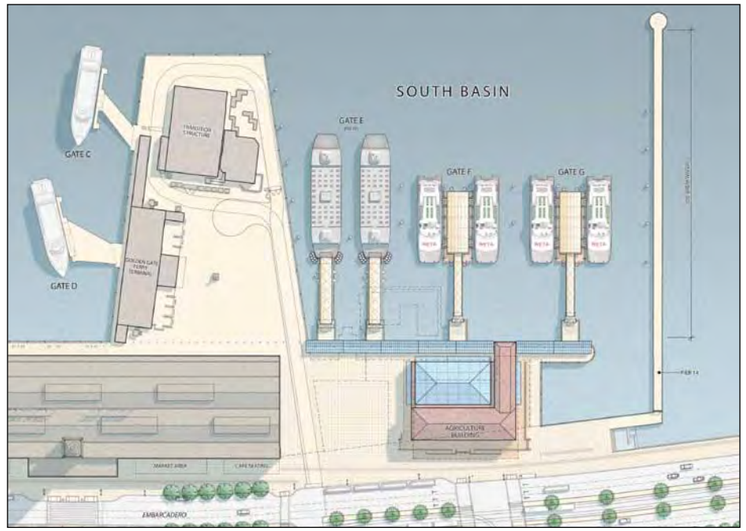


1976 - 1985

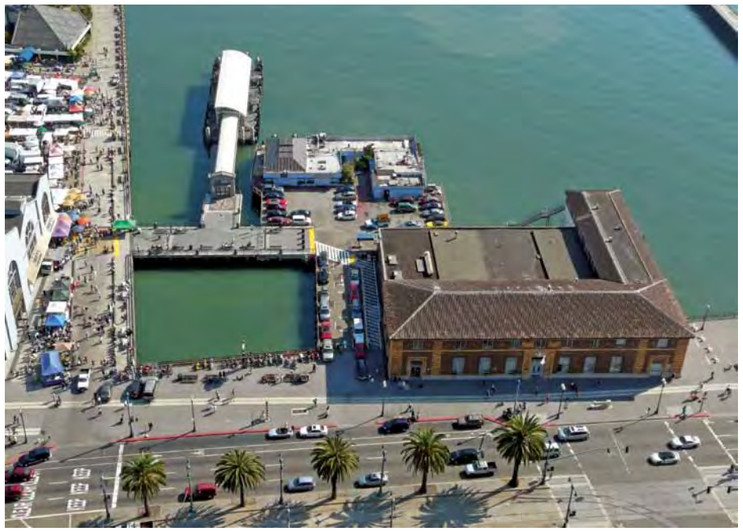


1986 - 2010

Figure 10: South Basin Summary of Physical Changes, 1915 to 2010



Phase 3 development of ferry terminal facilities in the South Basin, showing the potential rehabilitation of the Agriculture Building.



The existing lagoon interrupts pedestrian circulation and limits activity to Gate E and between the Ferry Building and Agriculture Building

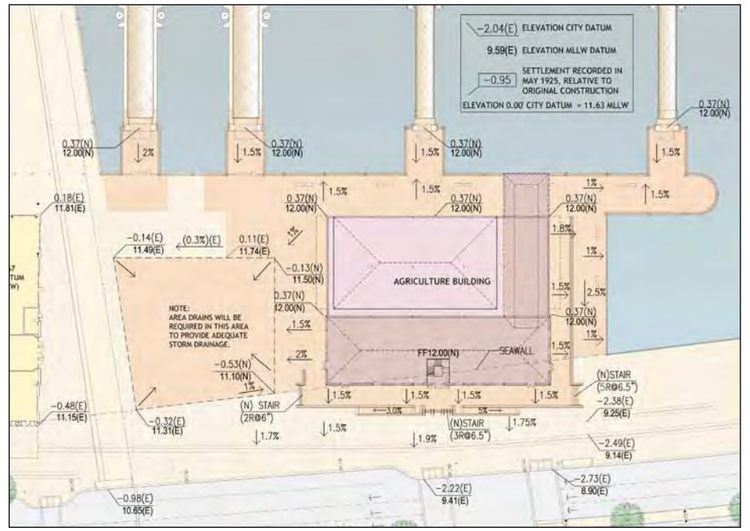


Figure 11: Preliminary Grading Concept Plan *(tone indicates new fill)*

View from the south of the Ferry Building area and ferry facilities in the early 1900s.

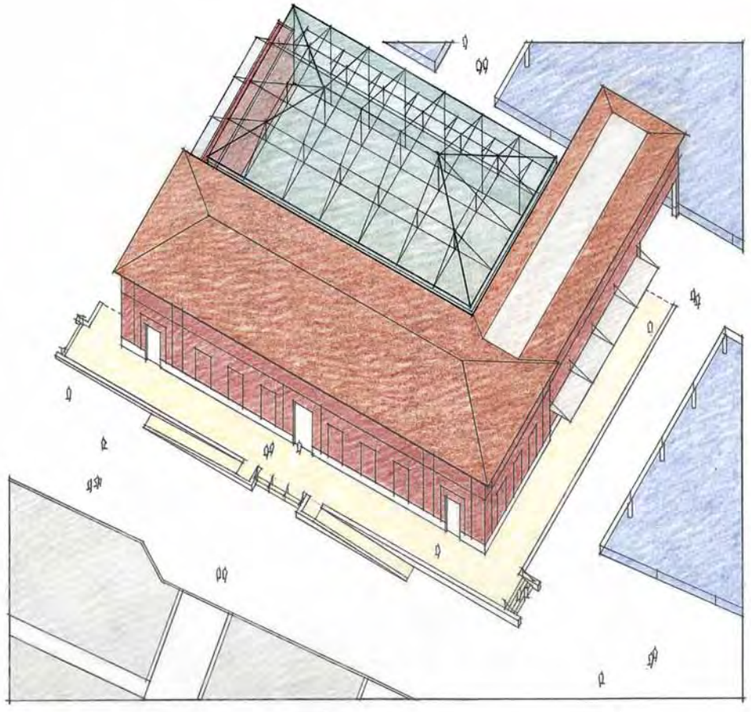
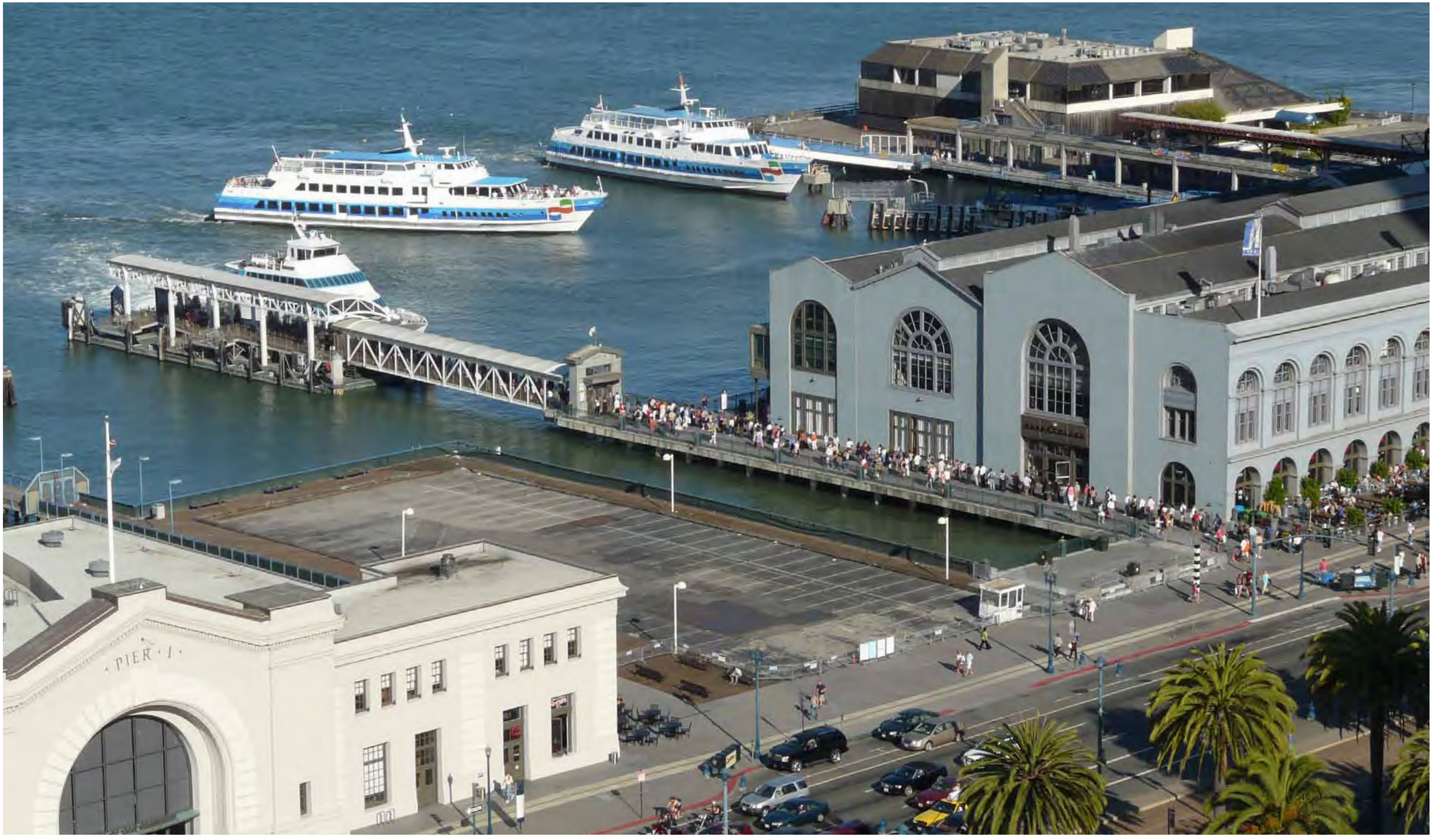


Figure 12: Concept for Elevating the Agriculture Building



View of the North Basin area showing passenger queuing for the Vallejo ferries at Gate B.

6. FERRY TERMINAL FACILITY REQUIREMENTS

The earlier Phase 1 efforts identified the general waterside parameters for planning and design of the Downtown Ferry Terminal which established the general layout and configuration of the harbor. Updated information is presented below that will help to provide further guidance in the design of these facilities, however these will be primarily focused on specifics within the broader context already set forth. The more significant changes that are anticipated to the requirements for the Downtown Ferry Terminal Expansion project are related to landside considerations. These have come about as a result of the emergence of WETA as the primary agency responsible for water transit in the region and, more specifically, its additional role in providing emergency response. Key parameters that affect the basis of design for both waterside and landside areas are described more fully in this chapter.

Ferry Service

Existing Services

The existing ferry services to and from Downtown San Francisco are provided by Golden Gate Ferry, City of Alameda, City of Vallejo, Blue and Gold Fleet, and Harbor Bay Maritime. Golden Gate Ferry provides services to Sausalito and Larkspur, and Blue and Gold Fleet operates services to Tiburon, Vallejo, Alameda, and Oakland. In addition, Harbor Bay Maritime operates the Alameda Harbor Bay ferry service. The ferry services to Vallejo, Alameda, and Oakland are sponsored by the City of Vallejo, the City of Alameda and the Port of Oakland, respectively. However, in the near future, WETA will be responsible for these ferry services in addition to the new routes that are currently under consideration.

The Ferry Terminal currently has four gates (Gates B, C, D and E) with services to Tiburon, Sausalito, Larkspur, Vallejo, Alameda/Harbor Bay, and Alameda/Oakland Jack London Square. Gate B accommodates Tiburon and Vallejo ferries, Gates C and D accommodate Sausalito and Larkspur ferries, and Gate E accommodates the Alameda/Oakland and Alameda Harbor Bay ferries. It should be noted that Golden Gate Ferry is in the process of preparing plans to improve their facilities at the Downtown Ferry Terminal; however, the details of improvements are unknown at this time. Individual routes are presented below.

Tiburon Ferry. This unsubsidized service is operated by Blue and Gold Fleet. Using the north side of Gate B, it operates to the Ferry Building during peak hours, and to Fisherman's Wharf during off-peak and weekend hours. Seven round trips operate to the Ferry Building Monday through Thursday and one additional evening trip operates on Fridays. Peak AM arrivals are at 6:20, 7:10, 8:10, and 9:05 and peak PM departures leave the Ferry Building at 4:25, 5:25, 6:15, and 7:15. There are about 600 passenger trips a day, with peak loads of approximately 150.

Vallejo Ferry. Currently operated by Blue and Gold Fleet for the City of Vallejo, and soon to be transferred to WETA, this service makes 12 round trips a day, landing at the south side of Gate B. The 300-passenger catamarans have operated at capacity in the past, but currently seem to carry a maximum of 200-220 passengers during the peak period. Reverse peak flow - which travels away from San Francisco in the AM peak and travels towards San Francisco in the PM peak - is relatively light. AM peak trips arrive at 6:30, 7:30, 8:00, and 8:45, while peak PM departures are at 3:30, 4:30, 5:15, and 6:00. Generally, AM and PM peak periods are considered between 6:30 a.m. to 9:30 a.m. and between 3:30 p.m. to 6:30 p.m., respectively. In addition to the ferries, Vallejo Transit also operates 14 round trip buses, which fill in the schedule between vessels, and park just north of the Ferry Building on the east side of the Embarcadero, near the walkway to Gate B. Daily ridership of ferries together averages about 2,200-2,400. Reverse peak flows are moderate.

Sausalito Ferry. Golden Gate Transit operates nine round trips on weekdays and six on weekends, generally using the rear berth at the Golden Gate facility. Peak ridership is probably focused on weekends and during special events in Sausalito, such as the annual art fair. Many bike riders, primarily tourists, also use the southbound services after riding rented bikes across the Golden Gate Bridge. AM peak trips arrive at 7:35 and 8:45, while PM peak departures are at 4:00 and 5:30. There are about 1,400 passenger trips a day, with peak loads of approximately 150. Reverse peak flows are considerable.

Larkspur Ferry. Golden Gate Transit operates 20 trips on weekdays and five on weekends, using a combination of 20-knot monohulls and 35-knot catamarans. These trips generally operate from the front berth at the Golden Gate terminal. AM peak arrivals are at 6:20, 7:05, 7:40, 8:20, and 8:50, with peak loads of 150-350. PM peak departures leave at 3:00, 3:35, 4:25, 4:55, 5:20, 5:55, and 6:20. There are about 4,500 passenger trips a day, with peak loads of approximately 345. Reverse peak flows are moderate.

Alameda – Harbor Bay Ferry. Soon to be operated by WETA, this service is now operated for the City by Harbor Bay Maritime. It uses the north side of Gate E south of the platform. It only operates during peak periods, with morning arrivals at 6:55, 7:55, and 8:55 a.m. PM departures leave at 4:35, 5:35, and 6:35. A final trip leaves at 7:35 p.m. Ridership averages 650 passengers per day with peak loads of approximately 125. Reverse peak flows are light.

Alameda/Oakland Ferry. This service, which generally uses the south side of Gate E, operates 12 trips on weekdays and eight trips on weekends and holidays. The route serves terminals on the Oakland Estuary at both Jack London Square in Oakland and at the Main Street Terminal in Alameda. Midday trips go to Fisherman's Wharf as well as the Ferry Building. AM peak arrivals at the Ferry Building are at 6:30, 7:35, and 8:40. PM peak departures operate at 4:20, 5:20, 5:45, and 6:25. Daily ridership averages 1,500 passengers and peak trip ridership averages 170. Reverse peak flows are light.

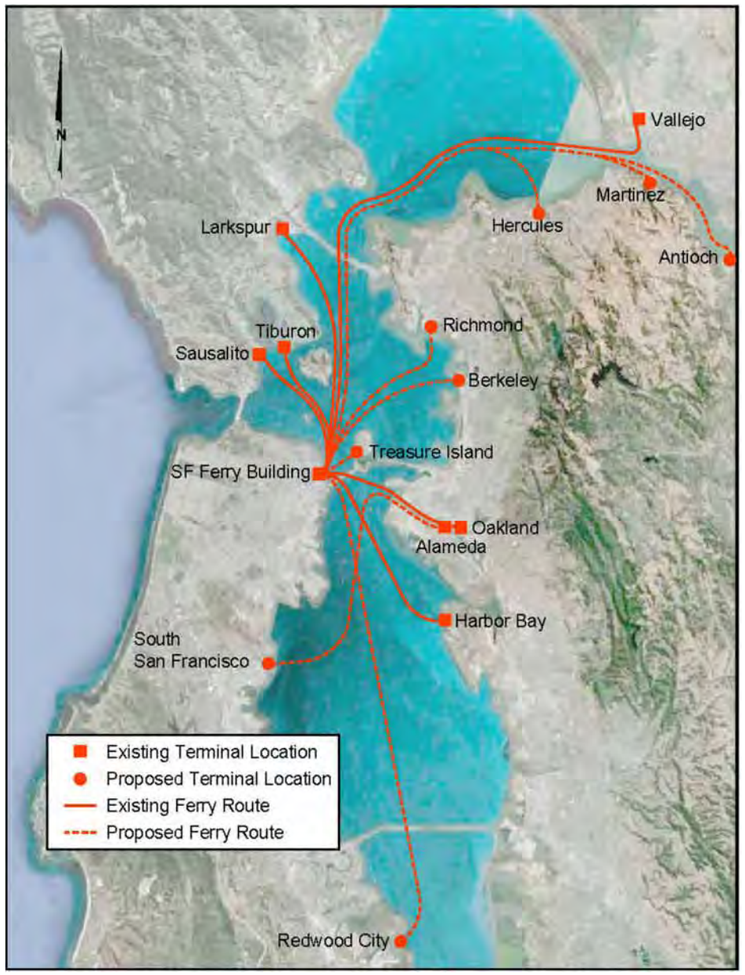


Figure 13: Existing and Potential New Ferry Routes

Potential New Routes

Potential new routes, as identified in the IOP and shown on Figure 13 above, include Berkeley, Richmond, Hercules, Antioch-Martinez in the North Bay, and Alameda Point and Redwood City in the South and East Bay, in addition to Treasure Island, which is addressed separately elsewhere in this report. The preliminary projected timeline for the new routes is 2013 for Berkeley, 2015 for Richmond and Hercules, 2020 for Antioch/Martinez and 2025 for Redwood City. Treasure Island is anticipated to initiate service by 2013.

Vessel Characteristics and Berthing Requirements

WETA's existing ferry fleet will soon consist of 12 vessels, including eight vessels from the Vallejo and Alameda services as described in Table 1. The fleet ranges in size from 149 to 400 passenger capacity with vessels ranging in service speed from 25 to 35 knots. All of the existing vessels are side loading. Therefore, all of the fleet can be berthed on a standard floating facility such as those currently utilized in the Downtown San Francisco Ferry Terminal and as are now being designed for the South San Francisco Ferry Terminal. The existing floating facilities in the Ferry Building area are comprised of steel floats while the new South San Francisco Terminal will be a concrete float design that will be a prototype for future WETA berthing facilities. Both the existing and the future facilities include moveable ramps that can be adjusted to respond to variation in vessel freeboards. In addition, both include an approximate 90-foot gangway that accommodates the tidal variation while meeting accessibility requirements.

New vessels will also be required for the Treasure Island service and it is anticipated that these will initially be side loading vessels similar to those in the WETA fleet. Ultimately, as demand warrants, the projections for Treasure Island indicate that a bow loading vessel may be required. In conjunction with the Treasure Island Development Authority (TIDA), a variety of vessel types were analyzed early on and a bow loading vessel was selected due to the short route and the need for quick passenger turnaround times. Bow loading vessels can be loaded/unloaded more quickly than side loading vessels due to the larger overall door/gate width. The double-ended loading vessels also have the advantage in that they do not need to turn around, which saves both time and space, and they can be configured for easy on and off accommodation of bicycles. A bow loading would have a length of 200 feet and a beam of 55 feet. The vessels could accommodate 399 to 699 passengers, with the greater passenger capacity available on vessels with a more developed upper deck.

In addition, some consideration is now being given to the potential use of hovercraft vessels for some ferry routes, such as Hercules, due to the need to minimize dredging and the ability to access shallow waters. The use of bow loading vessels or hovercraft require a different type and more specialized berthing facilities. However, both the bow loading and hovercraft berthing facilities can generally be accommodated in the same space that the existing and/or future side-loading facilities require.

Table 1: Existing WETA Vessel Fleet

Vessel	Capacity	Freeboard (in)	Service Speed	Year Built	Service
Encinal	400	64	25	1985	Alameda/Oakland
Peralta	318	62	25	2002	Alameda/Oakland
Bay Breeze	250	84	25	1994	Harbor Bay
Harbor Bay Express II	149	42	28	1995	Harbor Bay
Intintoli	300	114 for/108 aft	34	1997	Vallejo
Mare Island	300	114 for/108 aft	34	1997	Vallejo
Solano	300	114 for/108 aft	34	2004	Vallejo
Vallejo	368	68	34	1991/2001	Vallejo
Gemini	149	94.5	25	2008	Spare
Pisces	149	94.5	25	2008	Spare
Scorpio	199	94.5	25	2009	SSF
Taurus	199	94.5	25	2009	SSF

Figure 14: WETA 149/199 Passenger Vessel

Projected Ridership and Service Characteristics

In 2002, WETA generated ferry ridership projections for 2025 that are now being updated and should be available early in 2011. These projections include ridership based on assumed headways, fares, etc. for existing and potential new routes. Until the time when the updated projections are available from Cambridge Systematics (CSI), ridership will be based on Alternate 18 of the 2002 projections, which are summarized on Table 2. During the Treasure Island planning process, a number of projections of ferry ridership were completed. Because they were done on a different basis, they are described separately on Table 3.

From a ferry terminal planning perspective, the most important information is the number of arrivals during the peak period that is anticipated for each of the routes. For all of the routes served by the Downtown Ferry Terminal except for Treasure Island, the peak period is assumed to be from 6:30 to 9:00 AM. The peak for Treasure Island is in the PM, because Treasure Island serves both residential and commercial uses and, in the afternoons, it is anticipated that residents will be returning home from work and visitors will be en route to the island's commercial and entertainment venues.

WETA has provided assumptions for the number of peak period arrivals for each of the routes to be utilized in the planning for the Downtown Ferry Terminal facilities. The peak period arrival estimates are based on headway assumptions and potential routes projected in Alternate 18 prepared by CSI in 2002, with some adjustments to reflect WETA's current Level of Service (LOS) assumptions. The estimated number of peak period arrivals is also indicated on Table 2.

In addition to peak period arrivals assumed for planning purposes for each of the routes, the other key operating assumption that is required to determine the berthing requirements of the terminal have to do with turnaround time within the harbor for berthing a vessel, disembarking and/or embarking and departing. For planning purposes, WETA assumes 4 arrivals/hour on each float, if only one side is used; and 6 arrivals/hour if both sides of the float are used.

For Treasure Island, a number of projections have been developed for travel demand and modal split. The latest ridership projections were developed by Fehr & Peers for the Project Draft Environmental Impact Report (July

Table 2: Existing and Proposed Ferry Ridership

	Daily	Peak Period[1] Peak Direction Ridership (6:30 to 9 AM)	Peak Arrivals	Vessel Capacity
EXISTING ROUTES				
North Bay				
Tiburon	600	280	4	400
Vallejo	2,400	560	4	300
Sausalito	1,400	200	2	725
Larkspur	4,500	1,235	4	450-725
Central and South Bay				
Alameda-Harbor Bay	650	295	3	250
Alameda/Oakland	1,500	250	3	325
Current Totals	**11,050**		**20**	
FUTURE ROUTES				
North Bay				
Vallejo	4,423	1,200	5	300
Richmond	2,170	505	4	300
Tiburon	2,689	918	4	400
Berkeley	1,716	352	4	300
Hercules	1,124	291	2	200-300
Sausalito	4,111	1,192	3	725
Larkspur	6,836	2,143	5	450-725
Antioch-Martinez	2,066	477	2	300
Central and South Bay				
Alameda Point	1,219	219	4	200-350
Oakland	2,597	551	3	200-350
Alameda-Harbor Bay	680[2]	261	3	250
Redwood City	1,949	421	2	300
Treasure Island[3]	--	--	6	--
Future Totals[4]	**31,580**		**33**	

1. No significant difference in AM peak and PM peak ridership is noted.

2. The estimated demand of 581 by Cambridge Systematics for Alternative 18 is lower than the existing ridership. So, a slight increase from current levels is included.

3. Daily and peak period ridership for Treasure Island are shown separately on Table 3. Treasure Island vessel size: initial side loading 199-399, ultimate bow loading 399-699.

4. Future totals do not include Treasure Island.

Source: Ridership projections are from 2002 Cambridge Systematics 2025 projections. This is being updated and the table will be adjusted when new data is available. Vessel capacity data based on existing fleet used on runs. Peak period arrivals based on estimates provided by WETA.

Table 3: Treasure Island Ferry Ridership Scenarios

Design Event	*Passenger Volumes (Hourly) Inbound*	*Outbound*	*Total*
Build Out Transportation Plan (6,000 du) – Aggressive Transit (2006 Transportation Plan)			
Weekday PM Peak	2,250	457	2,707
Special Event (20,000 Attendees)			
Begin Event	3,500	100	3,600
End Event	100	3,500	3,600
6,000 du Emergency Evacuation (20,000 population in 6 hours)			
	100	3,500	3,600
Expanded Build Out (8,000 du) – AECOM (2009 Transportation Plan)			
Weekday PM Peak	2,416	491	2,907
Expanded Build Out (8,000 du) – AECOM (2009 Transportation Plan - updated 5/19/09)			
Weekday PM Peak	2,474	601	3,075
Expanded Build Out (8,000 du) – AECOM (2009 Transportation Plan - updated 11/11/09)			
Weekday PM Peak	1,384	348	1,732
Build Out EIR (6,000 du) – Reduced Transit (Fehr & Peers – provided in 2009)			
Weekday PM Peak	717	542	1,259
8,000 du Emergency Evacuation (27,000 population in 8 hours)			
	100	3,500	3,600

2010 Draft EIR

Design Event	*Passenger Volumes (Hourly) Inbound*	*Outbound*	*Total*
Build Out 2010 Draft EIR (8,000 du) – Base Transit Scenario (Fehr & Peers)			
Weekday PM Peak	479	343	822
Build Out 2010 Draft EIR (8,000 du) – Expanded Transit Scenario (Fehr & Peers)			
Weekday PM Peak	719	516	1,235

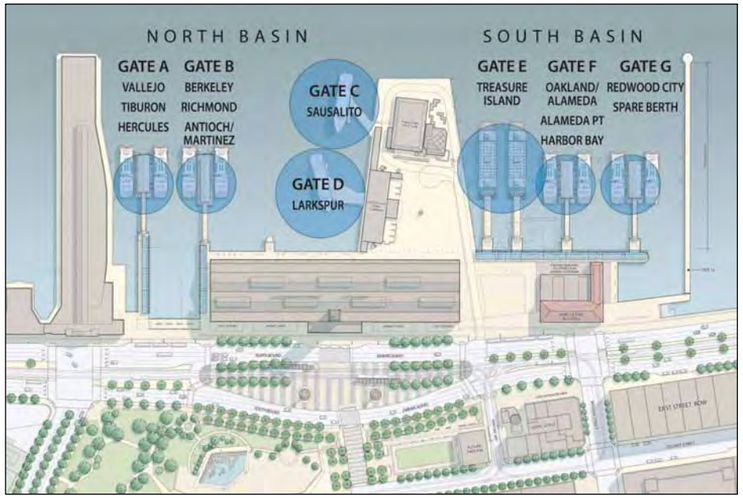


Figure 15: Potential Berthing Arrangements

2010). Their assumptions include both a Base Transit Scenario of 479 passengers and an Expanded Transit Scenario of 719 passengers for daily commuting by ferry in the PM peak direction. The EIR and the earlier projections are summarized on Table 2. In addition to the projections for commuter ferry ridership, during earlier Treasure Island planning efforts, additional scenarios for ferry service during special events and/or for emergency evacuation were developed. In these scenarios, it was assumed that a special event of 20,000 people could be held and that this could generate a peak hourly directional demand of 3,500 passengers (assuming arrivals and departures occur over 2 hours each and 30% of event attendants arrive and leave by ferry). For the purpose of estimating emergency evacuation, it was also assumed that an 8,000 dwelling unit development could generate 27,000 residents, some or all of which might need to be evacuated by ferry. The evacuation of Treasure Island to the Downtown San Francisco Ferry Terminal would most likely only occur during a time that the emergency response transportation of passengers from downtown to the East Bay would not be required, and vice versa.

It should be noted that ferry ridership projections for Treasure Island are highly dependent upon assumptions regarding the island's residential usage of other travel modes, such as bus transit and personal auto. In addition, the timing of demand is also dependent upon the entitlement, market demand and absorption. For planning purposes, therefore, it was assumed that the initial demand for ferry ridership in Treasure Island could be accommodated initially in a side-loading vessel that can range from 199 to 399 passengers. Ultimately, when demand warrants, a double-ended bow loading vessel, ranging from 399 to 699 passengers, operating on 15 to 30 minute headways could be required.

Berthing Facilities

The concept for the arrangement of ferry facilities within the project area between Pier 1 and Pier 14 was initially developed in the previous Downtown Ferry Terminal Master Plan prepared in 1995 for the Port of San Francisco. The arrangement of the ferry terminals was reviewed and reconfirmed as part of this current work effort (see Figure 15). Within the project area, there is adequate space for one additional berth (Gate A) in the North Basin and two additional berths (Gates F and G) in the South Basin. In order to minimize crossover traffic, Gates A and B would best serve the North Bay routes – Vallejo, Tiburon, Berkeley, Richmond, Hercules, Antioch and Martinez. Gates E, F, and G would best serve the Central, East and South Bay routes – Treasure Island, Alameda, Oakland, Harbor Bay and Redwood City. Additional evaluation was undertaken and it was determined that Gate E would be the optimum location for the new Treasure Island service and that Gate F would then be needed to accommodate Alameda, Oakland and Harbor Bay, which is currently located at Gate E. Gate G could accommodate additional South Bay routes, such as Redwood City, and/or can be used as a spare berth. It is important to note that there is a significant amount of flexibility in terms of the berthing arrangements and scheduling for the new and expanded service to the Downtown Ferry Terminal.

An early evaluation was undertaken to determine where most appropriately the Treasure Island service would be located and this is documented in greater detail in a separate chapter of this report. Gate E was selected as the best location for that service because it eliminated the crossover traffic with East Bay service, reduced dredging and created a more central location for the facility where backland fill could serve multiple purposes. The Alameda/Oakland and Harbor Bay service currently utilizing Gate E would then be relocated to Gate F. As previously discussed, the initial service to Treasure Island at Gate E would be provided by side-loading vessels utilizing a standard float. It is anticipated that when development on Treasure Island exceeds 4,000 units and demand warrants, the use of bow-loading vessels may be required. The bow-loading facilities would be constructed at Gate E. During construction, which is estimated to be a relatively short period of time, of the new bow-loading facilities, the Treasure Island service could be temporarily relocated to Gates F, while the Alameda/Oakland and Harbor Bay service could in turn be relocated to Gate G.

A number of potential operational plans were considered for how the proposed routes that provide service to and from the Ferry Building area could be accommodated. The conclusion of this preliminary investigation was that the future ferry services projected can be adequately accommodated by the five terminals within the Ferry Building area. However, in addition to the proposed routes, additional capacity should also be reserved for a vessel that needs to be temporarily moored due to vessel break down or for a spare vessel that may be required for emergency service, a special event, or for a visiting vessel. Furthermore, additional capacity will also be needed during the temporary relocation of ferry service from a terminal during reconstruction, repair and/or maintenance. Gate G offers the best location for the operational flexibility that is required. In addition, if an

	GATE A			GATE B			GATE C	GATE D	GATE E	GATE F			GATE G	
A.M.	Vallejo	Tiburon	Hercules	Berkeley	Richmond	Antioch/Martinez	Sausalito	Larkspur	Treasure Island	Oakland/Alameda	Alameda Point	Harbor Bay	Redwood City	Spare Berth
6:15		●												
6:30	●			●				●	●	●				
6:45			●		●						●		●	
7:00				●				●	●			●		
7:15		●				●								
7:30	●				●		●		●	●				
7:45				●				●			●			
8:00	●						●		●			●		
8:15		●				●								
8:30			●		●			●	●		●		●	
8:45	●			●			●			●				
9:00		●			●			●	●			●		
9:15														
9:30														

Note: Berthing assummes up to four trips per float per hour.

Table 4: Illustrative Berthing Schedule: AM Peak

alternative type of vessel, such as hovercraft, is selected for one or more of the service routes that cannot be accommodated on a standard side-loading float, Gate G could also be redeveloped for this kind of specialized facility.

An illustrative draft scheduling plan was prepared, as shown in Table 4, to demonstrate how the ferry service to and from the Ferry Building area could be accommodated. However, it should be noted that arrivals may need to be staggered on adjacent gates to avoid conflicts between turning vessels upon their departure. To avoid such a conflict, in actuality one route could be scheduled about 5 minutes staggered or offset from the other. This draft scheduling plan assumes that the preferred schedule for a float would be based on 4 trips per hour. However, for emergency purposes, this number could be increased to 6 trips per float per hour. In the illustrative schedule, arrival times were also included for the projected demand for the Larkspur and Sausalito facilities operated by Golden Gate Ferries.

Bathymetry and Dredging

Side loading vessels are assumed to require a navigable depth of 10 feet, while concrete floats required a depth of 12 feet and bow loading vessels require a depth of 14 feet. The Condition Survey prepared for the Port by eTrac Engineering which is presented in Figure 16, indicates areas less than 10 feet in depth closer in to the shoreline where there will be a need for dredging for all of the new terminals – Gates A, F and G. On the other hand, Figure 16 shows that, from a dredging point of view, the bow loading vessels, which require the greatest depth, are best accommodated at Gate E, where the existing bathymetry is generally indicating depths greater than 14 feet. The area of Gate A indicates a depth of approximately 8 to 9 feet and will require dredging to a depth of 10 to 12 feet for the terminal, however the approach seems to have adequate depths for navigation. In the area of Gate F, the depth ranges from approximately 8 to 9-1/2 feet and will require additional dredging to 10 to 12 feet for the terminal. Gate F will also require some dredging for the vessel approach to the terminal. In the area of Gate G, water depths are generally indicated to be in the neighborhood of 8 to 8-1/2 feet and would have to be dredged to 10 to 12 feet for the terminal. Gate G will require additional dredging for the vessel approach area and the most dredging of any of the new terminals.

A sedimentation study has not been performed at this stage and shoaling rates for the berthing areas are not known, but will be needed for the design/permitting phase of the project for environmental documentation.

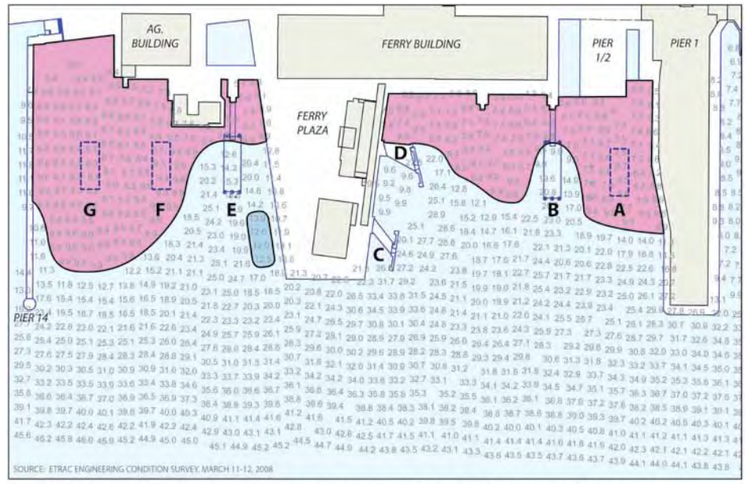


Figure 16: Bathymetry

Another issue that will need to be assessed in further detail during the design phase is the potential impact of proposed dredging and anticipated scour (from vessel operations) on infrastructure in the vicinity, including the San Francisco Transition Structure under the Ferry Plaza (SFTS). However, based on preliminary available data related to the infrastructure, this does not appear to be an issue.

Landside Queuing and Waiting Requirements

Captured waiting areas, like the ones that are used for the Golden Gate Ferry Service were not utilized in the development of the first phase of the Downtown San Francisco Ferry Terminal and are not intended to be utilized for the future ferry terminals being developed for WETA. The Ferry Building area is seen today as a mixed use activity area that meets not only the requirements of waterborne transportation, but serves as a major public gathering space. To the greatest extent, the waiting function, that is the early arrival to meet a ferry, can be integrated within the Ferry Building and in the public spaces around it.

Typically, 10 minutes before a ferry arrives, passengers tend to queue up in an orderly, linear fashion so that they can ensure their desired place on the vessel and to make sure that they are accommodated, if there are more passengers than the available space. A 300-passenger queuing area should be provided directly adjacent to each of the ferry terminals. For people standing in line in an orderly queue, an assumption of 7 to 10 square feet per person is adequate.

Another way to look at queuing requirements is based on an estimate of the space required for an individual standing in line. An individual occupies an elliptical space that is approximately 24 inches wide and 18 inches deep. Studies have shown that bus commuters standing in line, whether to purchase tickets or to wait for a bus, take up approximately 19-20 inches for inter-person spacing. A somewhat larger space, approximately 15 square feet, is needed for passengers with bicycles. However, the upper end of the range (that is, 10 square feet) should be sufficient to incorporate an assumption that up to 20% of passengers on a commuter ferry may travel with a bicycle. Therefore, the provision of approximately of 3,000 square feet adjacent to each of the side-loading terminals is recommended, assuming a 300-passenger vessel capacity and an average of 10 square feet per person.

In addition to an adequate amount of space, a canopy structure should be used adjacent to each of the ferry terminals, not only to provide weather protection but also to create a framework for efficiently organizing passenger queuing into multiple lines, as commonly found in airports and other transportation terminals. On the structure, indications should also be given as to where passengers with bicycles and/or passengers who need special assistance in boarding should locate. Furthermore, the structure should also provide a location for real time information related to vessel arrival and departure and scheduling and other necessary information.

In addition to queuing areas, some areas for waiting in close proximity to the ferry terminals where passengers can stand or sit prior to queuing is desirable. However, as previously discussed, passengers have many opportunities within the Ferry Building area to wait and pass their time shopping or just browsing. Because the majority of the service is commuter oriented, the tendency is for passengers to arrive close to the scheduled ferry arrivals and the need for additional waiting space is probably more associated with weekend or visitor travel than it is with commuter travel. An assumption of 10-15 square feet per person is typically utilized for a combination of standing and sitting areas. Because there is a much larger peak demand in the Ferry Building for week-end events that far exceed the daily requirements associated with the ferry terminal, there is more than adequate open space areas for passengers to mill around, sit and wait prior

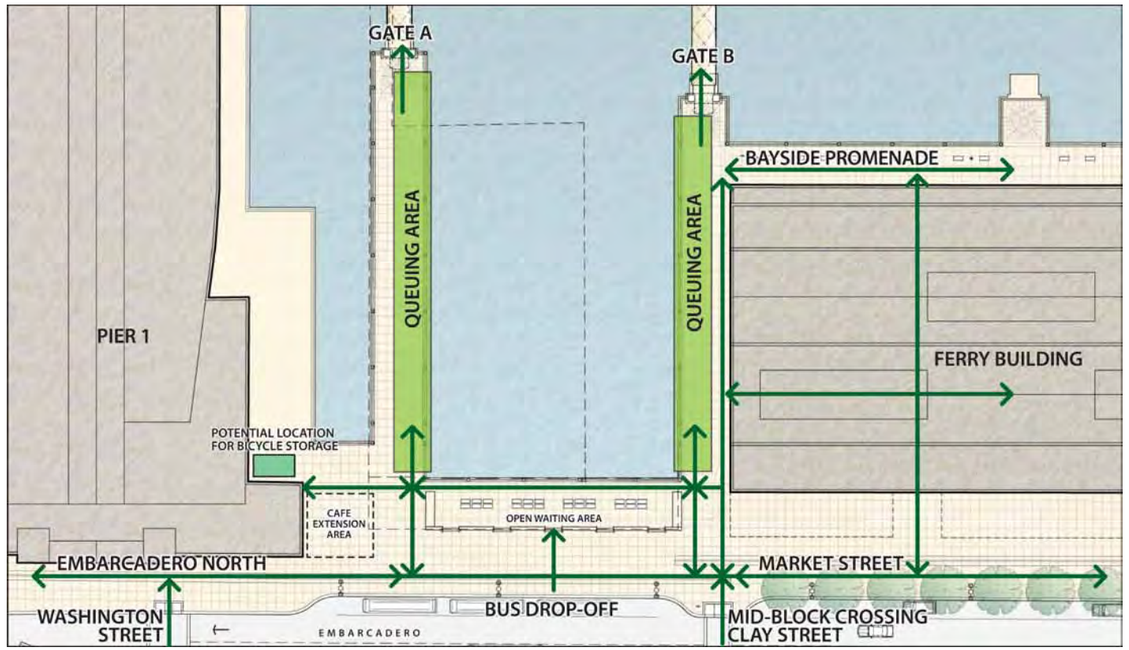


Figure 17: Gates A and B - Queuing, Waiting and Pedestrian Desire Lines

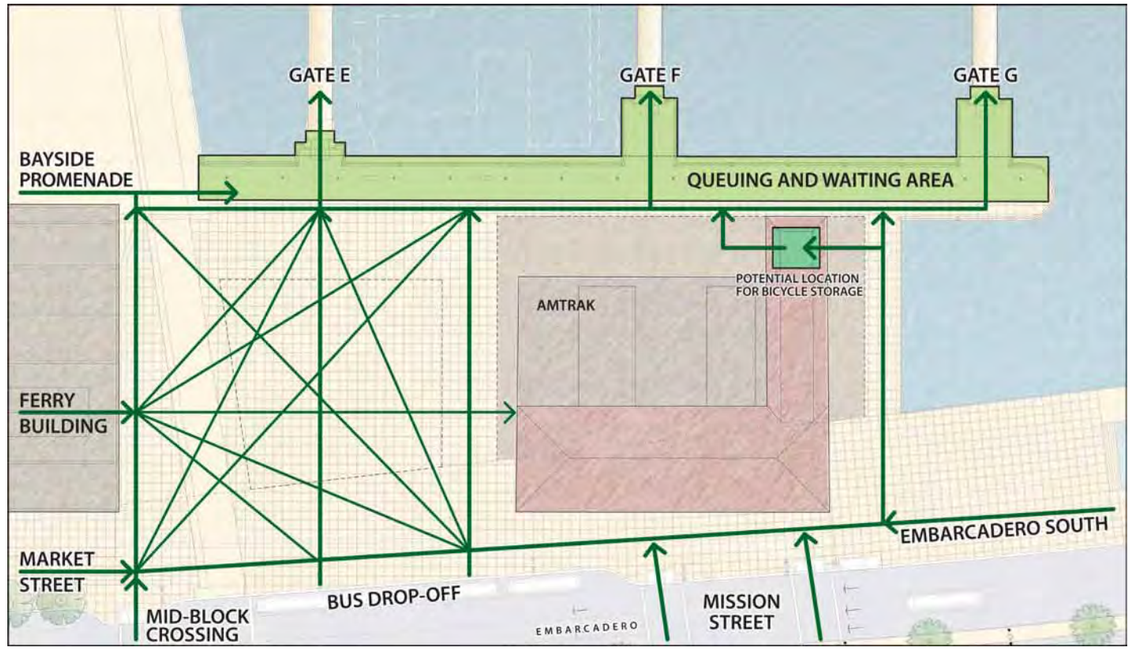


Figure 18: Gates E, F and G - Queuing, Waiting and Pedestrian Desire Lines

to getting into a queue for boarding a vessel. Benches, however, should be provided in close proximity to the ferry terminals for passengers that wish to wait close to the terminals prior to getting into a queue for boarding.

In the North Basin, a canopied area of approximately 3,500 square feet capable of accommodating 350 passengers should be available for queuing adjacent to Gate A and approximately 3,000 square feet should be available, capable of accommodating 300 passengers in a queue, adjacent to Gate B for daily boarding of vessels. An additional area of approximately 6,000 square foot with benches in between the two gates could be made available between the two gates for ferry patrons who arrive early and wish to wait in an open outdoor area prior to queuing to board a vessel. Figure 17 illustrates the queuing and waiting areas for daily commuter service in the North Basin area.

In the South Basin, one of the critical issues is improving pedestrian desire lines in the area between the Ferry Building and Agriculture Building as shown in Figure 18. With the addition of Gates E, F, and G, a canopied area of approximately 10,000 square feet should be provided for queuing. At 10 square feet per person, the canopied area would allow for the queueing of 1,000 passengers, or the equivalent of three boatloads. An extended promenade between the gates as well as a potential new plaza area between the Ferry Building and the Agriculture Building will provide not only for pedestrian circulation but also well-located open space for both standing and sitting passengers, who may wish to wait in an outdoor space prior to entering the queue. As previously stated in the North Basin, a waiting passenger arriving early has many options as to where they will spend their time prior to getting into a queue to board a vessel.

When and if bow-loading service is ultimately provided, it is envisioned that approximately 3,000 square feet of sheltered queuing and waiting area could be made available between the two berths of the bow-loading terminal. That area would provide for approximately 300 passengers assuming 70% of them standing, 10% sitting and 20% with bicycles.

Emergency Evacuation

In addition to the daily demand for commuter service, emergency evacuation is also an important consideration in assessing landside space requirements for the Downtown Ferry Terminal (Figures 19 and 20). The evacuation capacity is based on fleet size, destination which affects travel time, and the stage of development of the ferry terminal facilities. For example, as indicated earlier, for a period of time, the Treasure Island service could be handled by a 199 to 300 passenger side-loading vessel. Ultimately, a bow-loading vessel(s) with a capacity of up to 699 passengers may be utilized. Assuming that six vessels per hour can disembark from each of the gates, then Gates A and B would need to be able to handle up to 3,600 passengers/hour. In the South Basin, before bow-loading facilities are built, Gates E, F and G would need to handle up to 5,400 passengers. When bow-loading facilities are provided at Gate E and assuming a 600-passenger vessel is utilized, the South Basin would be able to handle up to 7,200 passengers (see Figure 21). Therefore, a total of 10,800 passengers could be evacuated within an hour utilizing the Port of San Francisco and WETA facilities. Additional evacuation capacity could also be provided by the

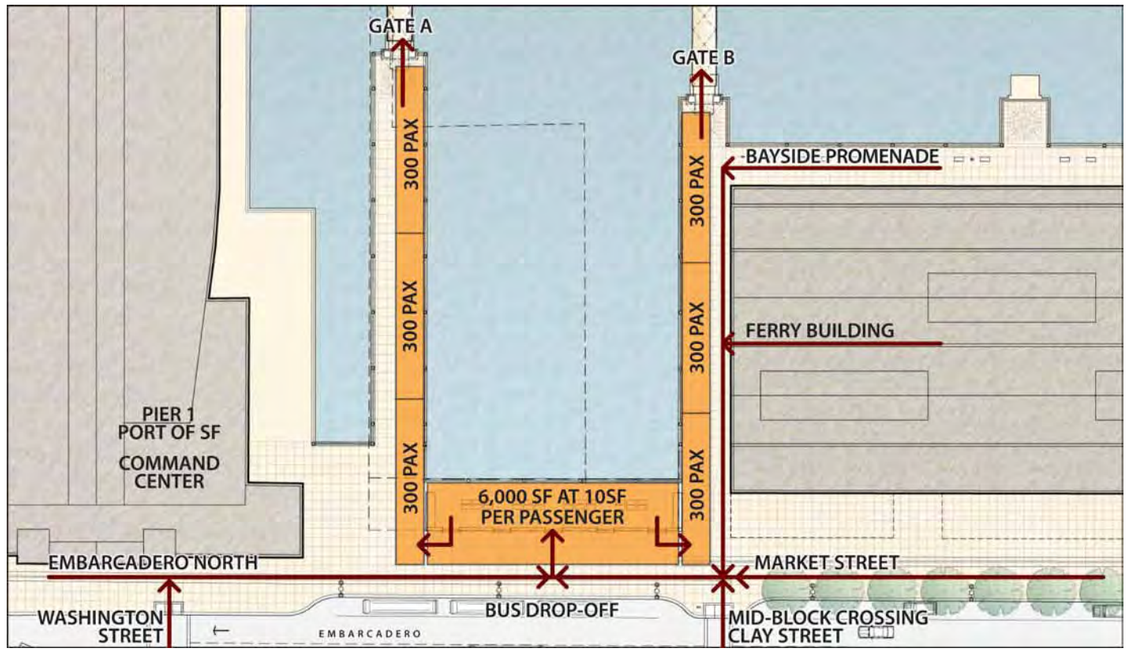


Figure 19: North Basin - Queuing, Waiting & Emergency Evacuation

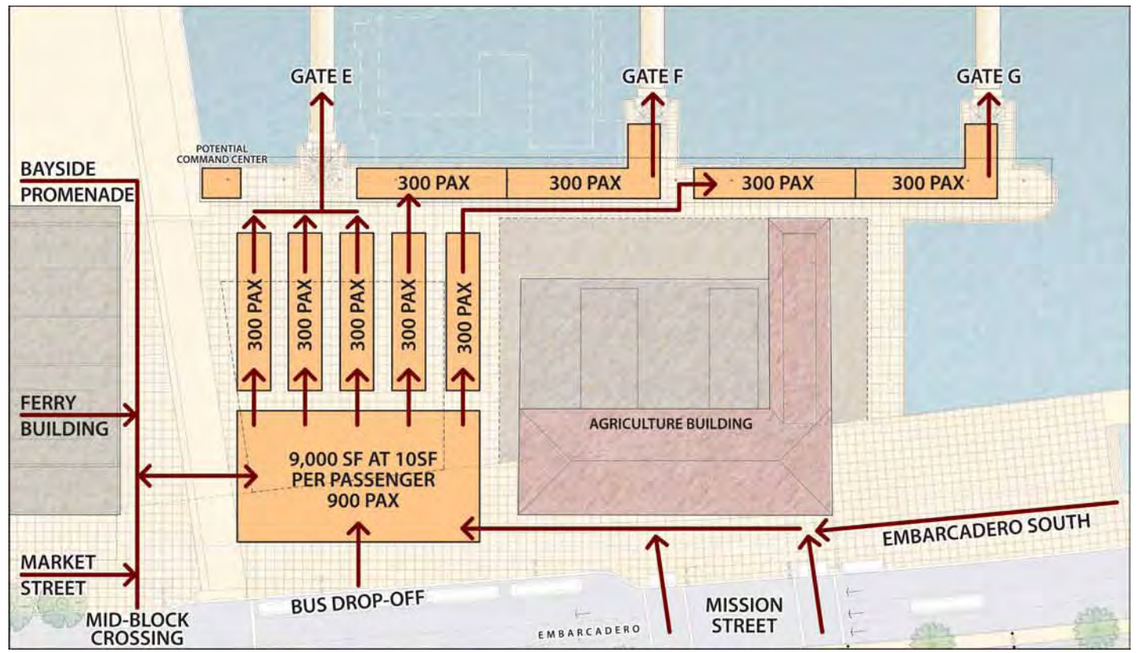


Figure 20: South Basin- Queuing, Waiting & Emergency Evacuation

Golden Gate ferries and it is assumed that the combination of the captured waiting areas that are currently provided as well as the Ferry Plaza, would more than adequately provide for their staging needs.

In determining the landside requirements for emergency evacuation, it is important to note that the amount of space available is only one factor to consider. Crowd management is an additional factor that is essential not only for the organization, orderly and efficient evacuation of passengers but also to prevent crowds from panicking and thus creating potentially life-threatening situations. Staff would be required to help organize queues, inform passengers and generally provide a sense of safety and security. The confidence and sense of security of a large crowd is closely tied to the amount of real time information and communication that is provided. Furthermore, in calculating the space required for waiting and/or queuing, additional passenger space will also be needed for movement and crowd control. Furthermore queuing and movement space would need to be demarcated in some fashion, such as with stanchions and retractable belts. Predetermined holes for stanchions are not recommended, because they don't provide the flexibility that is needed in case of an emergency and it is very difficult to address the tripping hazard and water retention that a hole in the pavement would create. In an emergency, queuing space could be reduced to as little as 5 square feet per person which allows adequate space for standing without touching others, but with little ability to move freely. According to John Fruin in Pedestrian Planning and Design (1971) and other more recent articles, this is an occupancy level similar to that of a waiting situation at approaches to a busy escalator or stair. Anything less than 5 square feet per person would involve involuntary touching and brushing and a psychological threshold that should generally be avoided in most public situations. Waiting space in an emergency condition might also be reduced to as little as 10 square feet depending on the length of time that passengers must wait until they can get into a queue and onto a vessel. At 10 square feet per person, it is assumed that most everyone would be standing and movement would be on an "excuse me" basis. In calculating areas and in applying them for emergency queuing and waiting, it is important to remember that the movement of the crowd has temporal and dynamic characteristics. That is will be arriving, waiting, queuing, boarding and departing in cycles as boats arrive and as passengers flow in to the area.

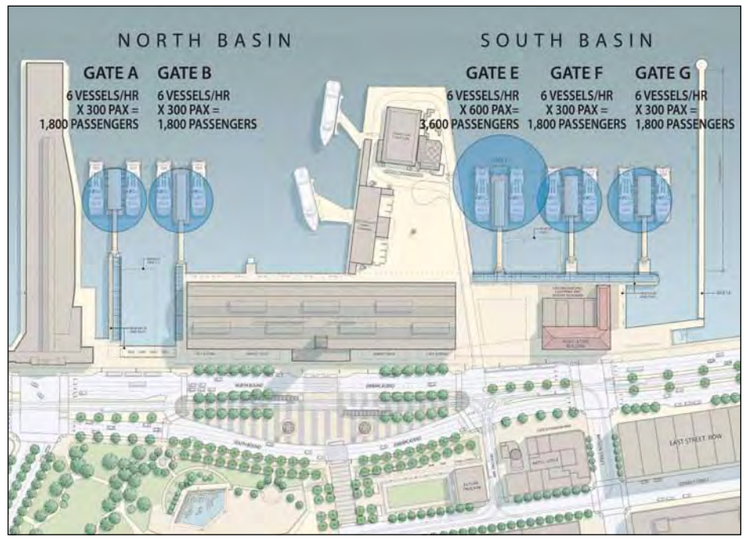


Figure 21: Emergency Evacuation Berthing Capacity

Landside area requirements have been evaluated for emergency evacuation for both the North Basin (Gates A and B) and the South Basin (Gates E, F and G). This evaluation is summarized, along with the daily commuter needs, below.

For emergency evacuation in the North Basin area, a queuing area for approximately 1,000 passengers could be organized at each of the gates, based on 5 square feet per person and assuming that appropriate crowd management assistance would be available. This would be equivalent to approximately three boatloads at each of the gates with a maximum wait of 29 minutes for those in the queue assuming the departure of 6 vessels per hour per gate. In addition, approximately 600 passengers or 2 additional boatloads could be in waiting in the 6,000 square foot area between the two terminals, assuming 10 square feet per person. It is assumed that these passengers would be directed into a queue as vessels are boarded while additional passengers arrive to take their place from the Embarcadero, the adjacent promenades or the Ferry Building and other nearby areas. Figure 19 illustrates the queuing and waiting space arrangement that could be organized for emergency evacuation in the North Basin area.

Two emergency evacuation scenarios have also been developed for the South Basin area. The first assumes the emergency evacuation occurrence is during the phase of construction when all three gates are served by 300 passenger side loading vessels. The second scenario assumes an occurrence after bow-loading vessels with a capacity of 600 passengers operate from Gate E. In the South Basin, as in the North Basin, 5 square feet/person for queuing areas and 10 square feet/person for waiting areas are assumed for planning purposes. This assumption, as in the north, also assumes that crowd management personnel are available to assist in directing and organizing the staging and flow of passengers from waiting areas to queuing areas and to the vessels. It also assumes that movement space is accounted for separately between the ferry queues and the waiting areas.

Scenario 1 illustrates in Figure 20 how three boatload queues for each of the three gates could be organized for a total of nine queues. The queue lines are based on 5 square feet/person and a maximum wait of half an hour for queuing at each of the gates. This illustration also shows how an additional 9,000 square foot waiting area could be located to accommodate 900 additional passengers at 10 square feet/person. It is assumed that, as passengers board a vessel, crowd management personnel would direct people from the waiting area to the queuing areas and then new arrivals would be directed to the waiting areas in a continuous cycle until demand is satisfied.

Scenario 2 assumes an emergency queuing, waiting and evacuation strategy when Gate E provides for 600-passenger bow-loading vessels. This scenario would have a similar landside area and configuration of passengers as in Scenario 1 and therefore it is not depicted. Scenario 2, however, would have more berthing capacity than Scenario 1, therefore the evacuation time would be decreased for the waiting passengers.

In addition to queuing and waiting space for emergency response, storage space will also be required for temporary barriers or stanchion equipment and signage utilized for special events, seasonal or holiday travel extremes, etc. Space for special security equipment may also be required. The storage space for emergency equipment may be a shared area with the Golden Gate Ferry facilities and/or the Port.

Pedestrian Circulation and Access

Ferry rider surveys conducted at the time of the initial master planning effort for the Downtown Ferry Terminal concluded that the majority (63%) of ferry patrons arriving in San Francisco walked to their destinations. Most of the remainder also walk across the Embarcadero to transit or the large taxi queue on Drumm Street adjacent to the Hyatt Regency Hotel. During that planning effort, one of the major issues was the enhancement of pedestrian access to the existing and proposed ferry terminals. The Ferry Building, which as a result of ill-conceived remodeling projects over the years, created a significant barrier to pedestrian movement within and through the 660-foot long structure. Surveys conducted more recently reaffirm that the majority of ferry riders cross the Embarcadero on foot and walk to their destinations, which include a significant concentration of office and commercial uses, as well as transit and taxi connections within a 10-15 minute walking distance.

After the Loma Prieta earthquake, pedestrian connections were re-established and new pedestrian connections were implemented during the first phase of ferry terminal development. This included a new approximately 30-foot wide promenade on the north side of the Ferry Building connecting to Gate B and a new promenade on the southside of the Ferry Building that connects from the BART platform to Gate E. Both of these were constructed to an "essential structure" status so as to provide for access after a major seismic event. At the same time and in conjunction with the Ferry Building development, obstructions on the east side of the Ferry Building were removed and the bayside promenade was widened to create a north/south connection linking all of the ferry terminals. Also, during that period of time, surface parking was removed and a new promenade on the west side of the Ferry Building was built, and a plaza was constructed to facilitate the Market Street crossing and provided mid-block crossings at either end of the Ferry Building as well. In addition, the "F"-line trolleys were extended to the front of the Ferry Building in the plaza between the northbound and southbound lanes.

In August 2010, pedestrian volumes were counted by DKS Associates in nine locations, as shown in Figure 23, in and around the Ferry Building. The results of the survey for the weekday AM, mid-day, and PM peak periods and the Saturday midday peak period respectively over a 2-hour period are shown in Figures 24 and 25. They indicate that the main corridor through the Ferry Building (Location 9) experiences the highest volumes of pedestrian traffic, with 20,000 pedestrians on Saturday mid-day and 8,000 pedestrians on week-day mid-day. Pedestrian volume at this location is crowded on Saturday mid-day and adequate on weekdays.

The second highest pedestrian volume locations are Location 3, the crosswalk in front of the Ferry Building, and Location 4, crossing Harry Bridges Plaza in the Embarcadero median. Again pedestrian volumes are substantially higher on Saturday, with 12,000 pedestrians recorded at Location 3 and 10,000 at Location 4. Weekday pedestrian volumes at Locations 3 and 4 were substantially lower, with 7,000 pedestrians at both locations during weekday mid-day and 5,500 pedestrians during weekday PM peak period, and only 3,000 pedestrians during weekday AM peak period. Pedestrian volumes at these two locations are considered high and moderately crowded during weekend midday, but adequate and oftentimes free-flow during weekday midday, and AM and PM peak periods. Location 7, on the south side of the Ferry Building, had high pedestrian volumes (9,500 pedestrians) during weekend midday because of the Saturday Farmer's Market operation, and low pedestrian volumes during other periods. Locations 2 and 4 had relatively high pedestrian volumes on

Saturday (7,000-7,500 pedestrians), but low volumes on weekdays (3,000 pedestrians). All other areas had low pedestrian volumes during weekdays.

In addition to the pedestrian counts conducted by DKS Associates, general pedestrian flows in the Ferry Building area were observed by CHS Consulting Group on Wednesday August 25, 2010 between 4:00 p.m. and 6:00 p.m. Figure 22 illustrates general pedestrian trip distribution in the area. The majority of pedestrians were observed to be walking in the east-west direction crossing the Embarcadero. Of the people crossing the Embarcadero in the eastbound direction, approximately 90 percent of the pedestrians walked straight into the Ferry Building and less than 10 percent of the people either turned left or right in front of the Ferry Building. Of the people crossing the Embarcadero in the westbound direction, the majority walked straight onto Market Street with very few exceptions.

A significant number of people, approximately 70 percent, using the ferry service at Gate B (to Vallejo or Tiburon) were observed to be crossing the Embarcadero at the crosswalk just north of the Ferry Building. For the people using the ferry service at Gate E (to Alameda or Oakland), approximately 60 percent came from areas north of Gate E and approximately 40 percent came from areas south of Gate E. It is noted that a significant number of people who approached Gate E from the south were on bicycles.

Both of the proposed locations for the expansion of the ferry terminals in this phase of the work effort have significant constraints regarding pedestrian movement that need to be remedied in order to access not only the existing facilities but the new, proposed facilities. In the North Basin, with the removal of Pier ½, which has been red-tagged, the construction of a new access pier to Gate A and the improvement and expansion of the area between the two terminals will be a very important step in enhancing the circulation in that area. In addition, the removal of the curb cuts between Pier 1 and the Ferry Building creates new opportunities for bus drop-off or shuttle interface.

In the South Basin there are a number of issues for pedestrian access to the ferry terminals that must be addressed. One of these is related to enhancement of the north/south connection to the bayside promenade east of the Ferry Building and to the Golden Gate ferries and to the berths in the North Basin. Currently, the delivery trucks to the Ferry Building use

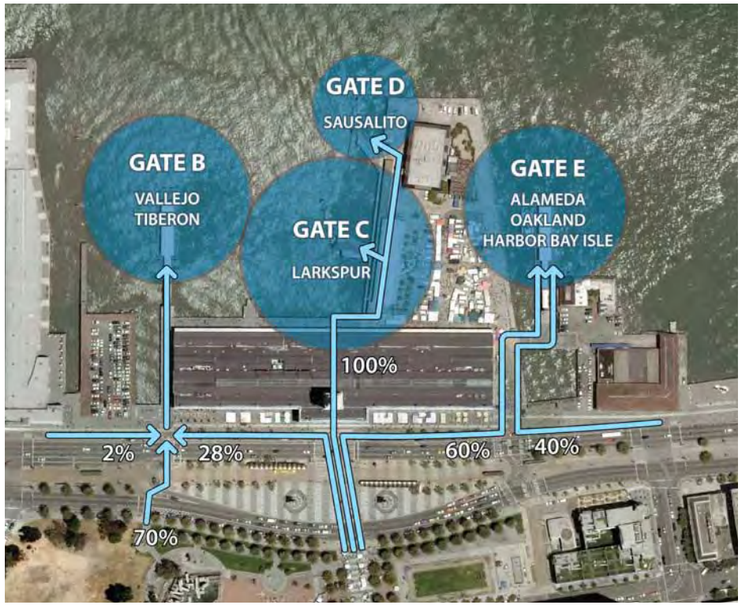


Figure 22: Pedestrian Trip Distribution

Figure 23: Pedestrian Count Locations

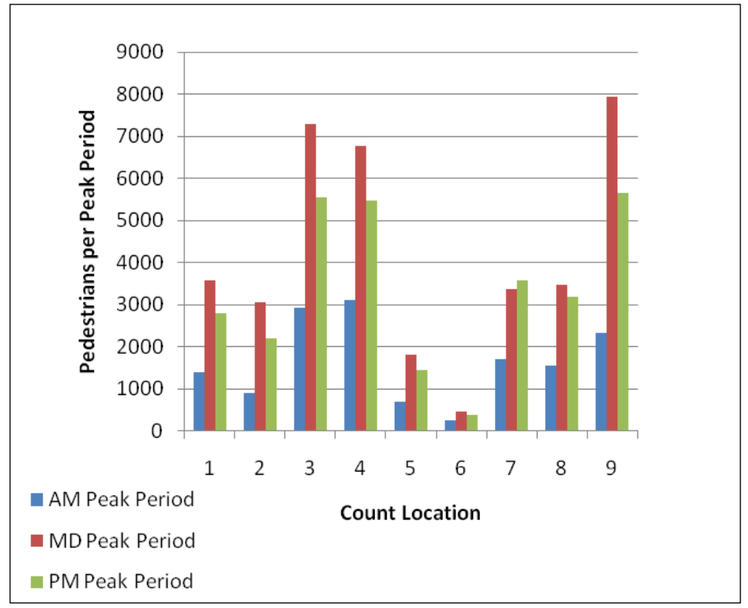


Figure 24: Weekday Peak Period Pedestrian Comparison
Source: DKS Associates

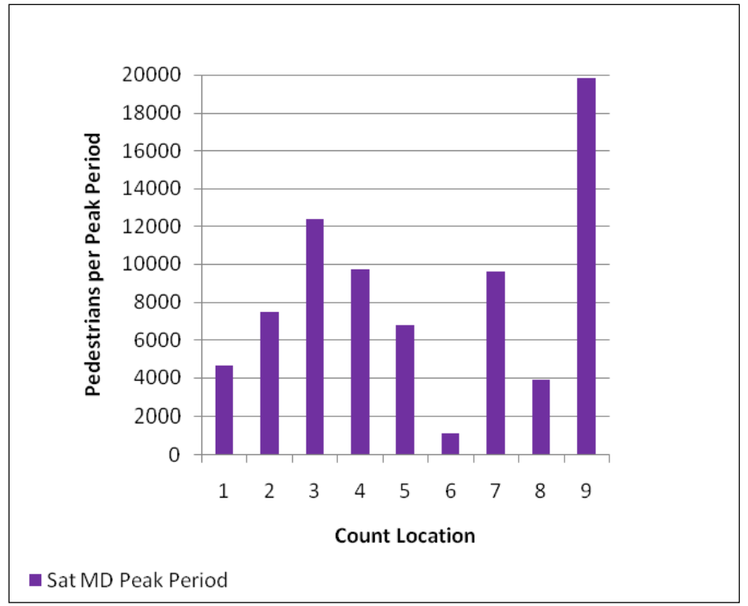
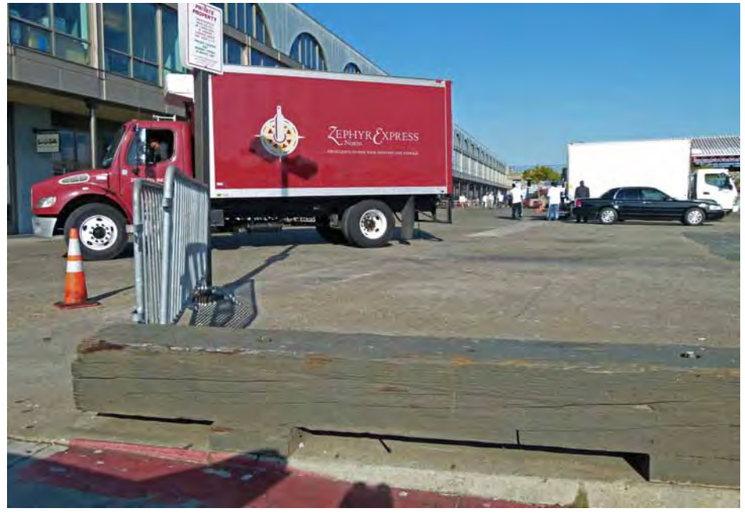


Figure 25: Saturday Midday Peak Period Pedestrian Counts
Source: DKS Associates

Improved pedestrian linkage between North and South Basin terminals is desired.



Service delivery and pedestrian conflicts need to be avoided.

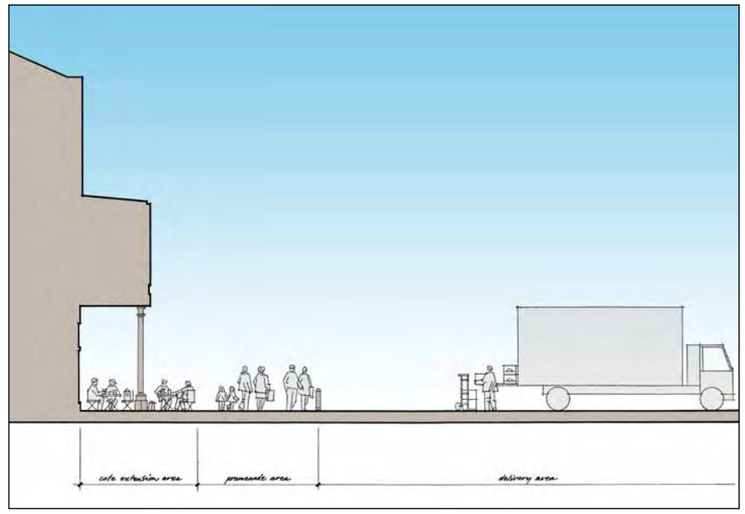


Figure 26: Use of bollards to help avoid pedestrian/truck conflicts

the level surface that was created for pedestrian access as a driveway and therefore create conflicts with that desire-line for pedestrian movement. This problem can be readily solved by bollarding the promenade extension at the Ferry Plaza and moving the driveway so that delivery takes place somewhat to the east (Figure 26). The delivery and service function is not so much an issue as it is how trucks access the area and the creation of a clearly demarcated pedestrian zone versus a mixed-use vehicular zone. In addition, the promenade area, which was improved during the first phase of ferry terminal development, needs to be expanded further to better relate to the east side access along the Ferry Building which was modified after the Ferry Building restoration was undertaken and no longer lines up with what was originally conceived to be a connection to the Ferry Building arcade. Now the connection is further east.

One of the most significant issues related to pedestrian access in the South Basin has to do with the obstruction created by the lagoon and the parking areas adjacent to the Agriculture Building. These form major impediments to pedestrian circulation not only to the existing Gate E but also to the future terminals at Gates F and G. In addition, these conditions limit the potential of Mission Street as a pedestrian crossing to growing workplace destinations south of Market Street and as an additional linkage to the transit connections on the west side of the Embarcadero and to the Transbay Terminal, which is now under construction. Furthermore, as the pedestrian counts and observations have indicated, the pedestrian and bicycle traffic from the south Embarcadero to Gate E and to future Gates F and G has grown as South Beach and Mission Bay have developed, and will continue to grow as waterfront properties south of the Bay Bridge are redeveloped for more active urban uses. The removal of Pier 2, the filling of the lagoon, the elimination of surface parking, the extension of the promenade and new linkage on the south side of the Ag Building will significantly improve pedestrian access to this area from multiple city destinations to the existing and future ferry terminals. It is also important to note that the traffic projections for Treasure Island, which is proposed to be located at Gate E, will create significant new pedestrian and bicycle demands within this area. Furthermore, it is important to note that the south side of the Ferry Building adjacent to the lagoon is the major emergency, service vehicle and drop-off access to the Ferry Plaza area and an important pedestrian connection to the Golden Gate Ferry Terminal and the Saturday Farmer's Market on the plaza. Improvements that minimize vehicular conflicts and enhance pedestrian and bicycle circulation in this tight area will be needed and proposals for consideration are included in the next chapter of this report.

Bicycle Circulation

In the vicinity of the Ferry Building, the Embarcadero, Market Street and parts of Steuart Street and Mission Street are parts of the Citywide Designated Bicycle Routes, which provide access to and from the Ferry Building to locations throughout the City. Along the Embarcadero, there is a Class II Bike Lane with a dedicated bike lane on roadway edge on both sides of the street. It is part of Route 5 in the Citywide Designated Bicycle Routes. In the southbound direction, the curbside parking lane becomes a tow-away zone between 3:00 p.m. and 7:00 p.m. As a result, what was a bike lane during the day becomes an additional travel lane and bicycle traffic is shifted to a parking lane during the evening commute period. There are no sharrows on the pavement but solid white lines delineate the bike lanes from vehicular traffic for daytime and the evening commute periods. In the northbound direction, a bike lane is striped between the curbside parking spaces and the travel lane. However, due to heavy vehicular traffic and parking maneuvers along the Embarcadero, bicyclists often use the sidewalk instead of the bike lane. Figure 27 presents the existing bicycle routes within the ¼ mile radius.

In the vicinity of the Ferry Building, Market Street is designated as a Class III Bike Route, where bicycles and cars share the same roadway. It is part of Route 50 in the Citywide Designated Bicycle Routes. Although Route 50 continues from Market Street to Steuart Street and Mission Street, which connects to the Embarcadero, bicyclists often use the Ferry Building promenade area to cross the Embarcadero instead of continuing onto Steuart Street.

Bicycle ridership has been increasing in the City as a whole and in particular along Market Street and the Embarcadero. In addition, trends indicate that more and more ferry riders will bring bicycles with them. With Treasure Island service, the potential for bicycle ridership at either end of the ferry trip and in the downtown is significant. Current projections are that bicyclists will comprise 20% of the ferry ridership from Treasure Island, and it is possible that this number may be exceeded due not only to the residential development but also by the recreational uses that are anticipated there.

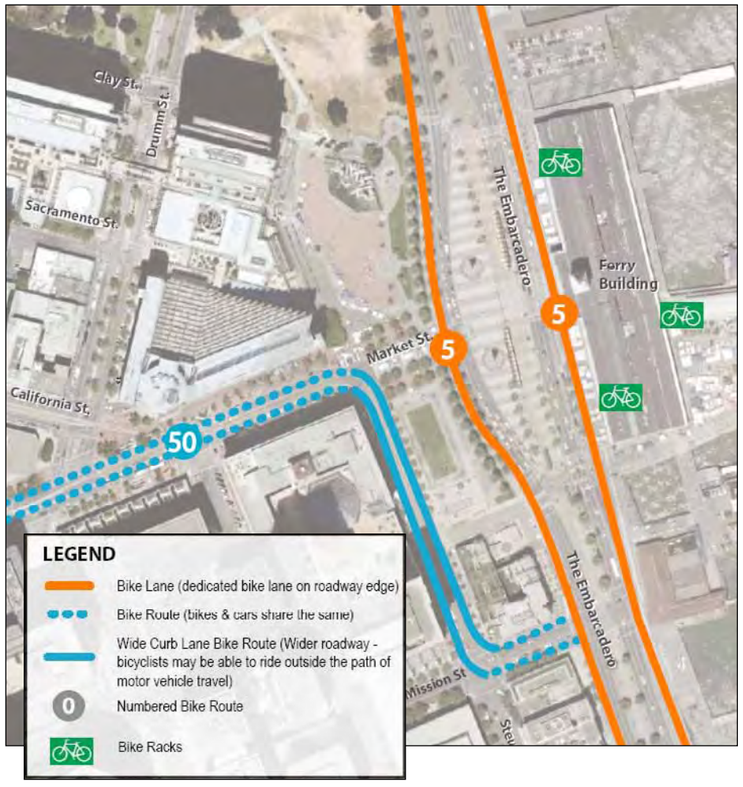


Figure 27: Existing Bicycle Routes

Bicycle accessibility to the ferry terminals must be improved in a manner that avoids conflicts with pedestrian movement. Currently, bicyclists move eastward on Market Street to the waterfront through the pedestrian-only area, avoiding the designated path on Steuart Street to Mission Street. Improvement of the Mission Street connection will increase in importance as the additional ferry gates to the south are built and as direct connections from the Transbay Terminal are provided.

Beyond the importance of improving the bicycle connections, there is also a general need in the area for well-located and secure bicycle storage. Today, several bike racks are located in front of and behind the Ferry Building and bike valet service is provided on Saturdays to accommodate the peak demand generated by the Saturday morning Farmer's Market. The Port of San Francisco has discussed the potential of locating a bicycle facility somewhere in the area to provide for bicycle storage, bike repairs, wash-down and rental. However, the demand for these improvements is not the result of existing or expanded ferry service since ferry patrons travel with their bicycles on-board and ride their bikes to workplace destinations.

Intermodal Transfer

Within a ten to fifteen minute walk of the Ferry Building is the greatest concentration of transit service in the region with 20 stops located within a ¼ mile distance. Within this area, public transit connections are provided by four transit agencies: San Francisco Municipal Transportation Agency (SFMTA), Bay Area Rapid Transit District (BART), Amtrak, and Vallejo Transit. Figure 28 presents the existing transit routes and stops located in the vicinity of the Ferry Building.

The SFMTA operates 13 bus routes, six light rail lines, one cable car line, and one streetcar line within the ¼ mile area. Of the total 20 transit stops located within the area, SFMTA has stops at 18 locations. Amtrak and Vallejo Transit's Baylink express buses have one stop each in the area. The Embarcadero BART Station is located a short distance from the Ferry Building and shares the underground station facilities with SFMTA's light rail services. Embarcadero Station serves as the last San Francisco stop for BART trains before entering the Transbay tube for destinations in the East Bay and is the terminus for most SFMTA light rail service except for the N-Judah and T Third Street which continue to Mission Bay. Amtrak provides a connection between San Francisco and Capitol Corridor trains at the Emeryville Station 33 times a day via its Thruway buses with a stop on the Embarcadero just south of the Ferry Building. Vallejo Transit's Baylink provides express bus service between San Francisco and Vallejo Ferry Terminal 14 times a day to supplement their ferry service. This bus stop is located on the Embarcadero just north of the Ferry Building. Among the lines serving the Ferry Building area, several routes are expected to get more frequent and reliable services in the future; however, no specific route changes are proposed in the area. From a ferry terminal planning point of view, the most important aspect related to enhancement of intermodal transfer is the provision of additional and improved signage and way-finding, so that those who are not familiar with the transit services can find them.

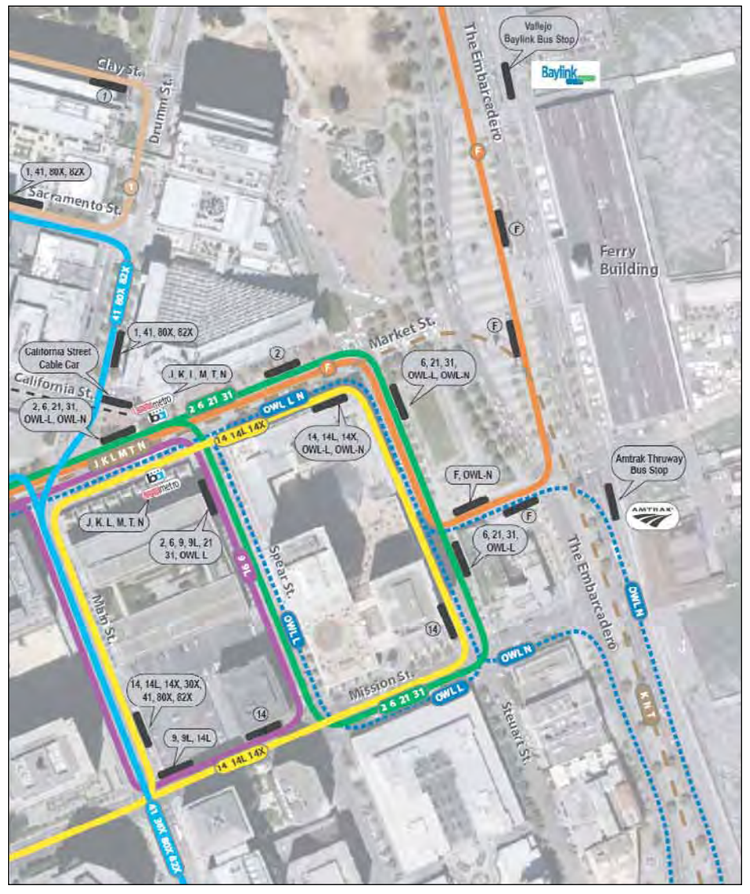


Figure 28: Existing Transit Routes

Overview of the existing Downtown Ferry Terminal.

7. PRELIMINARY FERRY TERMINAL EXPANSION PLAN

Waterside Requirements

The Downtown San Francisco Ferry Terminal Expansion Project includes the addition of three new ferry terminals for the build-out of the berthing facilities in the Ferry Building area. These facilities are projected to meet the potential demand for both new routes and increased ridership. In providing facilities to meet the future demand, it is anticipated that there is also a need for a spare berth to accommodate a potentially disabled vessel, a visiting vessel and for emergency evacuation purposes. A preliminary evaluation has been undertaken and it has been determined that the existing and new North Bay routes (Vallejo, Tiburon, Berkeley, Richmond, Hercules and Antioch/Martinez) can be accommodated at Gates A and B and that the South, East and Central Bay routes can be accommodated at E, F and G.

A significant amount of evaluation was undertaken relative to the location of the Treasure Island service. Because of the short headways, more centralized location for the distribution of the significant volumes of projected ridership, the importance of limiting crossover traffic, and to minimize dredging, Gate E was selected as the location for that service, both during the initial phases when side-loading vessels would be utilized and ultimately, if and when bow-loading vessels are required in order to meet the future demand as development proceeds on the island. The location of Treasure Island at Gate E will necessitate the relocation of Oakland/Alameda/Harbor Bay service to Gate F. Gate G is the most logical location for the spare berth and would ultimately be available for service to Redwood City or additional South Bay services that may be available in the future. It can also serve an alternative vessel type, such as hovercraft, if ever that were warranted.

It is anticipated that the new ferry terminals, similar to those that currently exist, would include a 90-foot long gangway and a 45 foot by 115-foot concrete float (excluding fenders). The terminals would also allow for a variety of freeboard ranges that meet the WETA fleet requirements. A limited amount of dredging will be required in order to provide adequate depths for the approach and berthing of vessels as well as for the floats at Gates A and G. A very limited amount of additional dredging may also be required at Gate E for bow-loading vessels in the future.

Landside Requirements

Landside areas must be provided for pedestrian access to the ferries as well as for queuing and waiting. These areas have been sized to meet the requirements for pedestrian circulation, service and emergency access as well as for passenger queuing and waiting and for emergency response (see Table 5). The North Basin landside improvements include the demolition of Pier ½; the construction of a new 27 by 210 foot access pier for Gate A and the construction of an informal waiting area between Gates A and B. In addition, a canopy structure, that is 20-feet wide by 180-feet long, will be provided at Gate B and a structure that is 20 by 205 feet will be provided at Gate A. No additional modifications to the promenade of Gate B are anticipated and the existing entry portal to the gangway and float are to remain. However, a new portal similar to the one at Gate B will be constructed at Gate A to manage access to the gangway and float. Additional improvements associated with this terminal include the provision of real time information, signage and lighting. The informal area between the two terminal facilities will also include a number of benches and trash receptacles and a potential location for bicycle lockers in the vicinity of Gate A is identified for consideration by the Port of San Francisco, associated with its facilities at Pier 1.

In the South Basin, the landside improvements include the demolition of Pier 2 and Sinbads and the apron area north of the Agriculture Building. The improvements would include construction of a 30-foot wide promenade area that would interconnect Gates E, F and G with the Ferry Plaza and Ferry Building in the north/south direction. It would also include a connecting promenade on the south side of the Agriculture Building to provide a second means of egress from the promenade and improved access from Mission Street and the south Embarcadero. The improvements would also include the filling in of the lagoon (about 12,000 square feet) and the replacement fill of the apron areas to the south of the lagoon (see summary table below). This fill will allow for the freedom of movement from multiple destinations to and from all of the ferry terminals as well as between the Ferry Building and the Agriculture Building. It would also provide informal areas for passenger waiting during daily commuter service and is essential to meet emergency access, queuing and waiting requirements. Furthermore, this area could also serve to relieve the Ferry Plaza during the Saturday Farmer's Market and thus would contribute to better activity linkages and improved accessibility to the Golden Gate Ferries.

A canopy structure that is 24-feet wide and 458-feet long is also proposed for the South Basin area and is to be built along the length of the new promenade that interconnects the three terminals. The canopy will provide weather protection as well as create an organizational structure for queuing and waiting. Additional improvements include real time information, signage, benches and trash receptacles. Potential locations for bicycle storage facilities are also identified in the South Basin.

A major consideration of design was to minimize filling in compliance with BCDC policies. As shown below, preliminary estimates indicate that the removal of existing fill is balanced with new and replacement fill.

Table 5: Summary of Demolition and Fill

	Demolition (sf)	Replacement (sf)	New Fill (sf)	Shadow Fill (sf)
PHASE 2				
North	26,900	9,500	1,000	6,500
South	20,400	9,200	23,400	13,000
PHASE 3				
North	0	0	0	0
South	480	0	3,500	<1,800>
Total	***47,300***	***45,600***		***17,700***

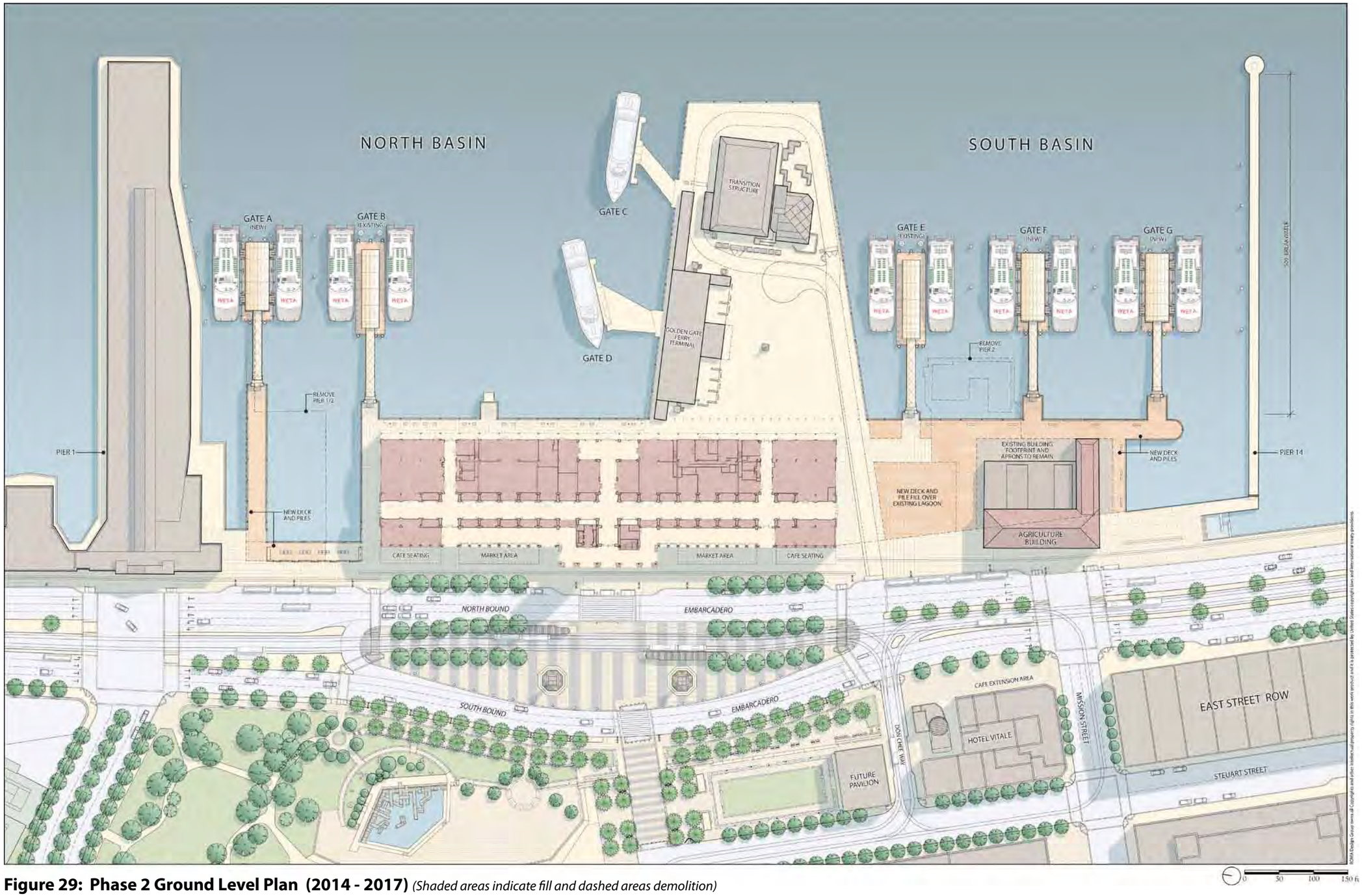


Figure 29: Phase 2 Ground Level Plan (2014 - 2017) *(Shaded areas indicate fill and dashed areas demolition)*

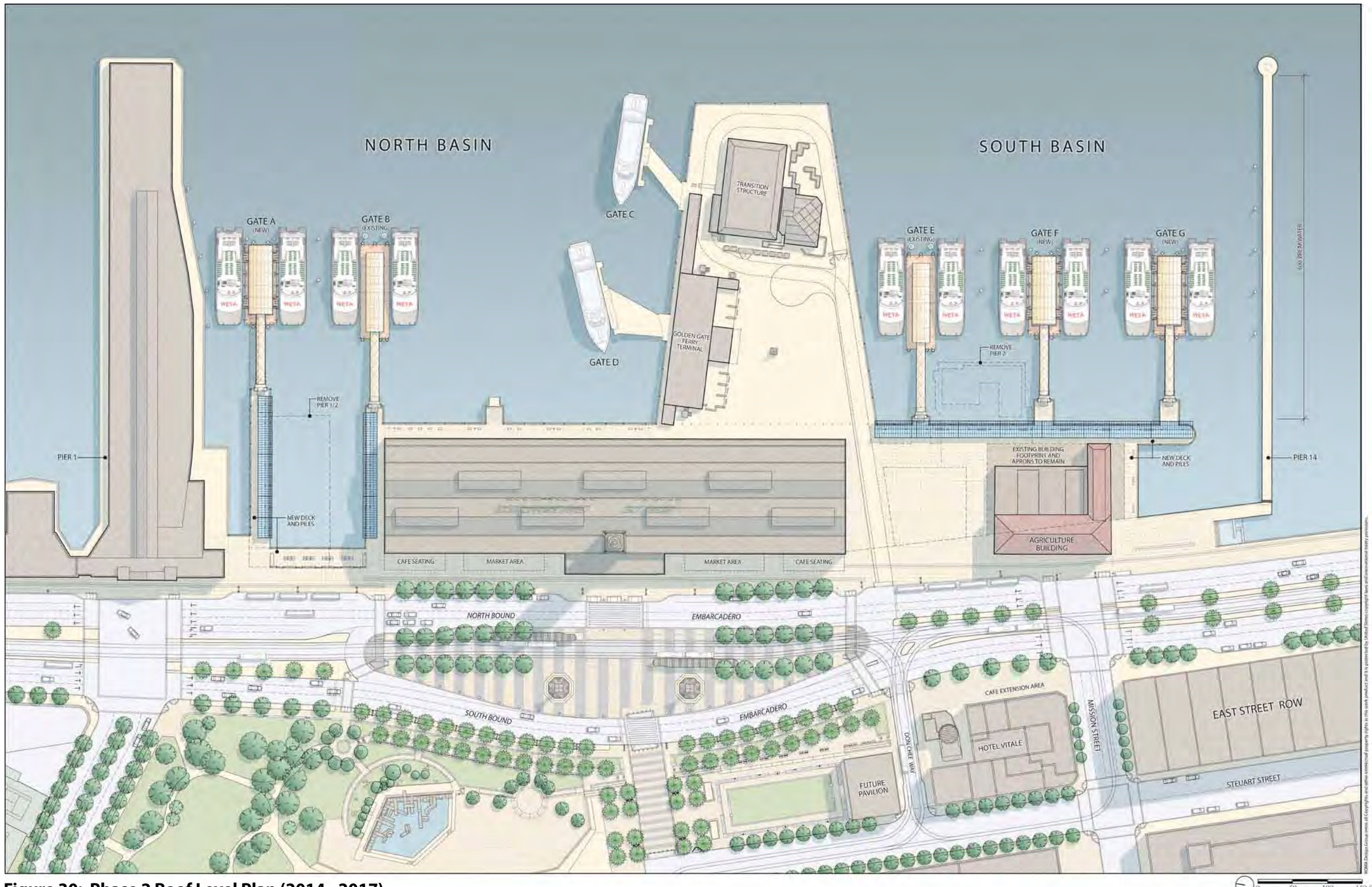


Figure 30: Phase 2 Roof Level Plan (2014 - 2017)

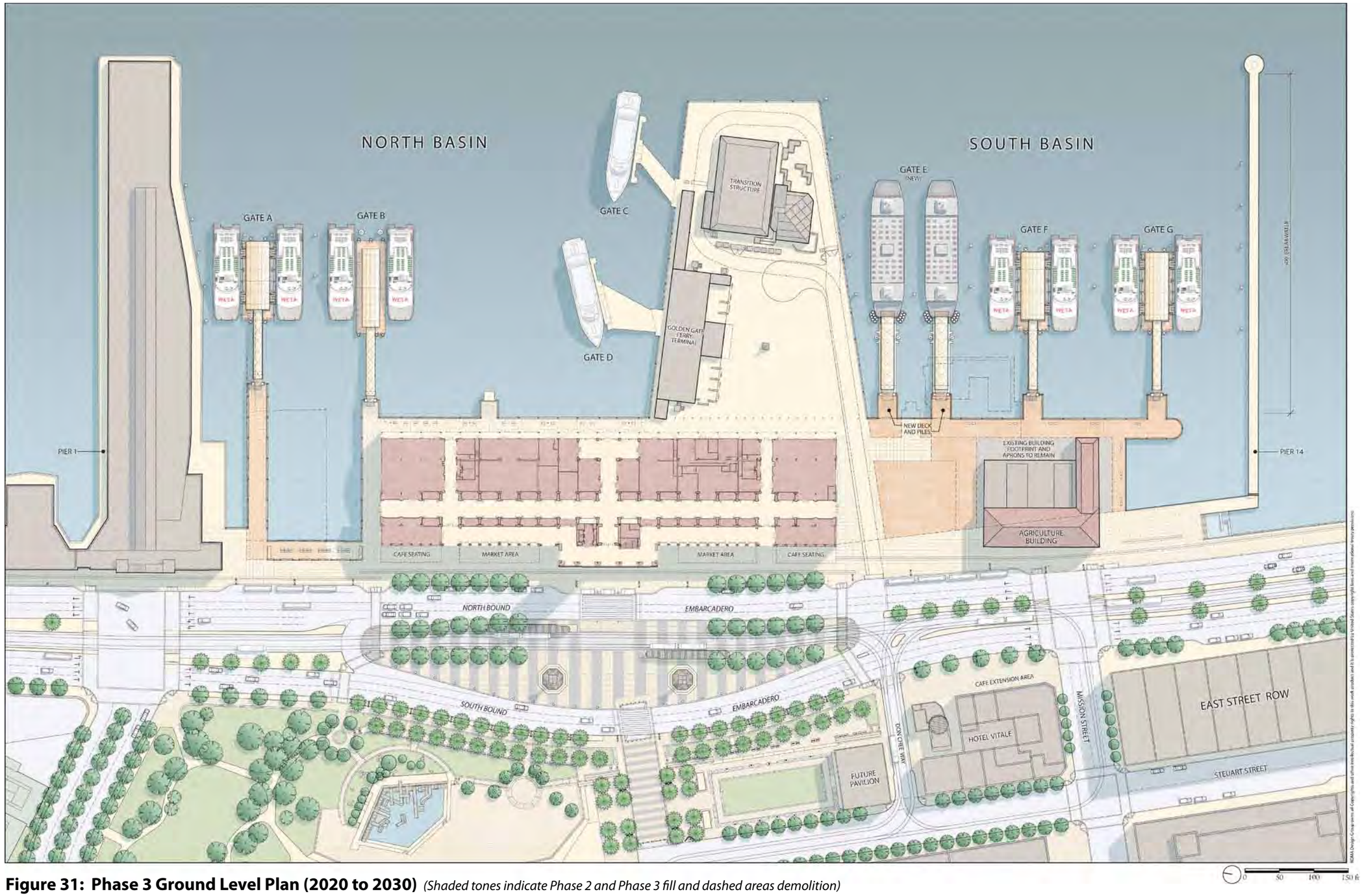


Figure 31: Phase 3 Ground Level Plan (2020 to 2030) *(Shaded tones indicate Phase 2 and Phase 3 fill and dashed areas demolition)*

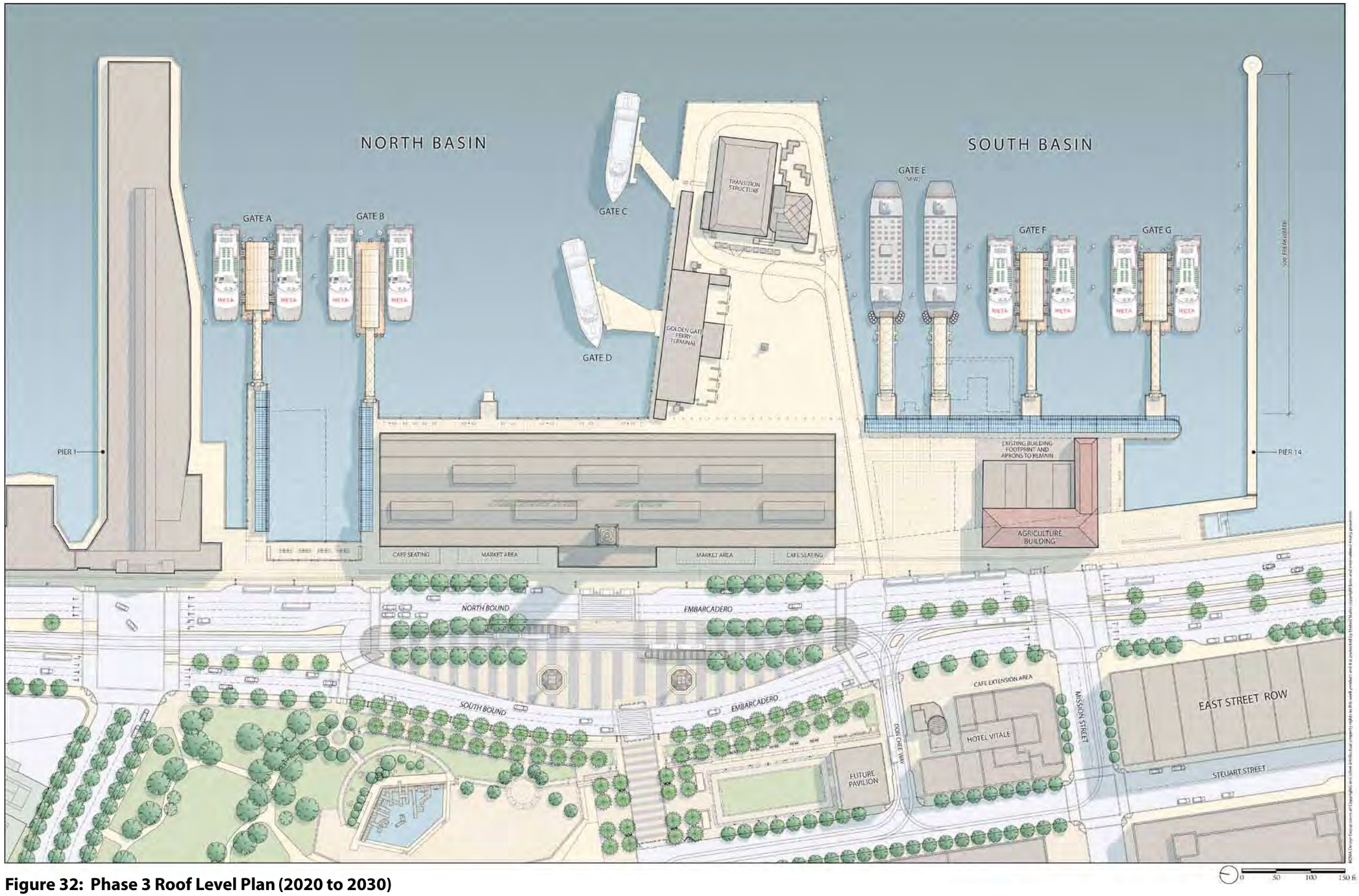


Figure 32: Phase 3 Roof Level Plan (2020 to 2030)

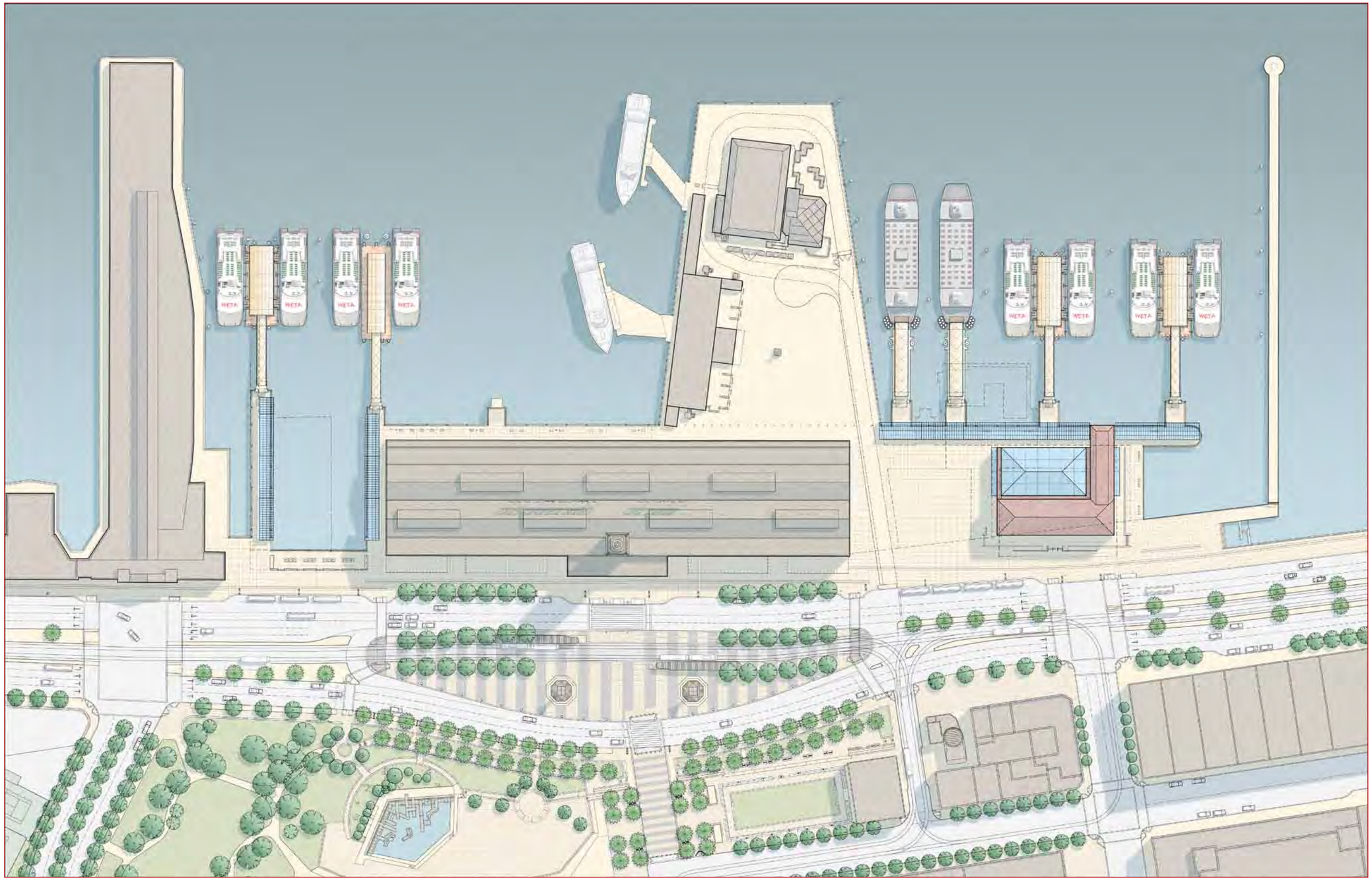


Figure 33: Phase 3 Roof Level Plan (2020 to 2030) *(with potential future renovation of the Agriculture Building)*

8. PRELIMINARY PUBLIC SPACE IMPROVEMENT CONCEPTS

The public space improvement concepts go beyond the functional requirements of ferry terminal expansion previously discussed to address the qualitative considerations affecting public access, pedestrian circulation, shoreline appearance and the enhancement of the area as a convivial place that allows the community and the region to participate in this unique setting, where the downtown of San Francisco meets the bay. These improvements are intended to reinforce the civic stature of this historically significant location, heighten a sense of awareness of the bayfront environment and contribute to its identity, meaning and role in the life of the city and the region.

The concepts address both the North Basin and South Basin improvements as well as the existing Ferry Plaza. In developing the concepts for the public space program, it is important to recognize that today a new level of maturity has been reached, and that the area is starting to work together as a cohesive entity, where one activity synergistically contributes to another. For example, the Saturday farmer's market brings greater success to the established ground floor uses in the Ferry Building. In the same way, the more the area is established as a water transit hub, the more attractive it will become as a gathering place.

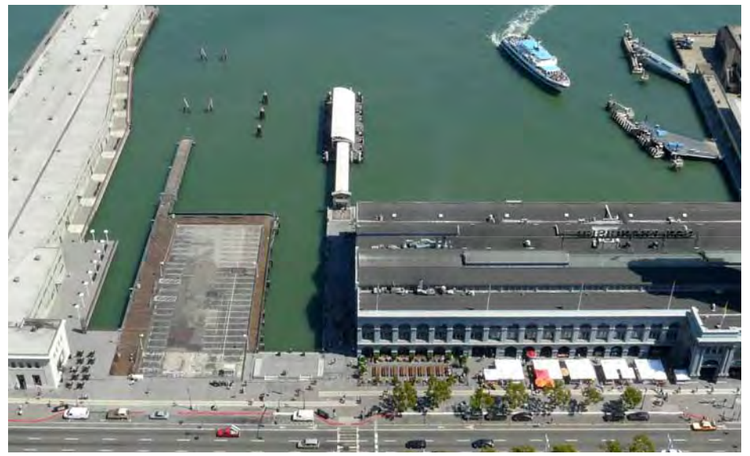
Following the review of this report, design refinements will be undertaken and an implementation strategy will be prepared. The implementation strategy will include construction cost budget estimates and potential funding and financing sources as well as responsibilities for construction and management between the Port, WETA and other stakeholders within the area.

North of the Ferry Building

In the space north of the Ferry Building, the development of additional berthing capacity and the removal of the red-tagged Pier ½, will not only serve ferry ridership but will also enhance the public realm in a variety of ways. It will add to the diversity of experience by providing an immediacy and relationship to the bay that previously did not exist. The removal of Pier ½ will uncover a significant portion of the bay that has long been used for surface parking and will open up long, distant views and create a new perspective on the waterfront and the city. It will improve the quality of the experience from both the Embarcadero Promenade and the existing pedestrian area that connects to Gate B and to the north portal of the arcade in the Ferry Building. In addition, the construction of a new pier to Gate A along the former northern edge of Pier ½ will not only serve ferry patrons to North Bay destinations such as Berkeley and Richmond, but it will also provide a linear public access extension bayward. Like many pier environments, it will create opportunities for a greater engagement with the bay and for a more contemplative environment that contrasts the intensity of activities elsewhere in the Ferry Building area.

In addition to the basic reconfiguration of the land/water relationships in this area, the public space concepts in this area also call for the extension of the elevated viewing/sitting area that was recently reconstructed by the Port northward to the edge of the new public access pier to Gate A. This elevated wharf created by existing changes in grade provides a unique setting for sitting and viewing the bay, the arrival of ferries and pedestrian flow along the Embarcadero Promenade.

The improvements also call for the addition of canopy structures along the edge of pedestrian ways to Gates A and B that will help to organize the queuing and waiting of passengers, provide a structure for real time and way-finding information, and give overhead weather protection for passengers. The concept calls for a light, free-standing steel-and-glass minimalist structure which could include photovoltaic cells for enhancing sustainability and energy efficiency of the ferry terminals. This structure will also create a unique environment that will not limit public access but will enrich it by leaving a tracery of the role that these spaces play in ferry passenger embarkation even when not in use for that purpose. In this way, they will add to the authenticity and meaning of maritime activity and the diversity and complexity of what the Ferry Building area has meant in the past and what it will mean in the future.



Existing conditions at Pier 1/2 and Gate B

The existing queuing of passengers for the Vallejo ferry at Gate B extends to the Embarcadero and around the Ferry Building. This activity needs to be better organized with transit signage and weather protection for the comfort and convenience of ferry patrons and the efficiency and effectiveness of ferry service.

Figure 34: View of Gates A and B and Wharf Improvements

Figure 35: View of Gates A and B from the Bay

Figure 36: Oblique View of Gate B Canopy Design Concept

Figure 37: Ground Level View of Gate B Canopy Design Concept

Figure 38: Oblique View of Gate B Canopy Design Concept

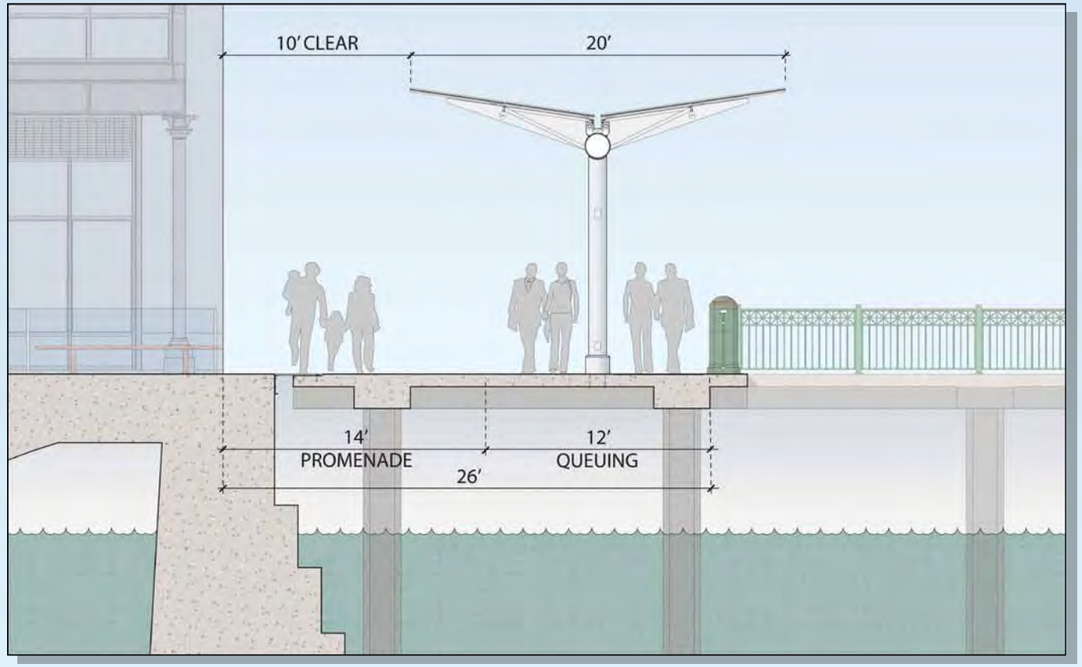


Figure 39: Section of Canopy at Gate B

Figure 40: Gate B Queuing Area Canopy Design Concept for Organization, Signage and Weather Protection

Existing areas to the south and east of the Ferry Building, showing use on a normal day, and relationship to the adjacent Embarcadero and Phase 1 ferry terminal at Gates B and E.

East and South of the Ferry Building

In the area to the east and south of the Ferry Building, the pile and deck-supported structures are a result of the construction of the BART Transbay Tube in the 1970's, the Phase 1 ferry terminal improvements or are trimmed-back remnants of once-extensive ferry slips. The pier structures that were built as part of the BART construction and the Phase 1 ferry terminal improvements are in sound condition. Pier 2 and all of the aprons adjacent to the Agriculture Building, however, are in substandard condition and in need of significant improvement and/or replacement. The portions east of the Ferry Building, which are generally known as Ferry Plaza, are under long term lease. On the other hand, Pier 2, Sinbad's and the adjacent aprons used for parking are on month to month leases.

As previously discussed, the landside improvements associated with the expansion of ferry terminal facilities in the South Basin include the extension and widening of the East Promenade that connects Gates E, F and G and the filling of the lagoon. All of these improvements are intended to provide for pedestrian circulation, queuing, waiting and emergency response and are to be built to an essential structure status as were the improvements undertaken in Phase 1. However, above and beyond the functions associated with ferry service, these areas will also be able to provide for public access and general enjoyment of the bay as well as other publicly-oriented uses and activities. This chapter includes concepts for the configuration, organization and treatment of public spaces and activities. It also addresses qualitative considerations related to the design of the landside ferry terminal improvements and the existing Ferry Plaza.

There are four components that comprise the public access elements of the east and south sides of the Ferry Building. They include the extension of the East Bayside Promenade, the creation of a new and distinctive South Bayside Promenade, the existing Ferry Plaza, and the new Embarcadero Plaza, between the Ferry Building and the Agriculture Building. These public space improvements work together in an integrated manner to create a publicly-oriented environment for circulation, activities and events that serve multiple purposes and enhance the opportunity for the future preservation and adaptive reuse of the Agriculture Building. They also go beyond the needs of the ferry terminal expansion program to enhance the Ferry Building area as a whole as a major public gathering place in the city and the region.

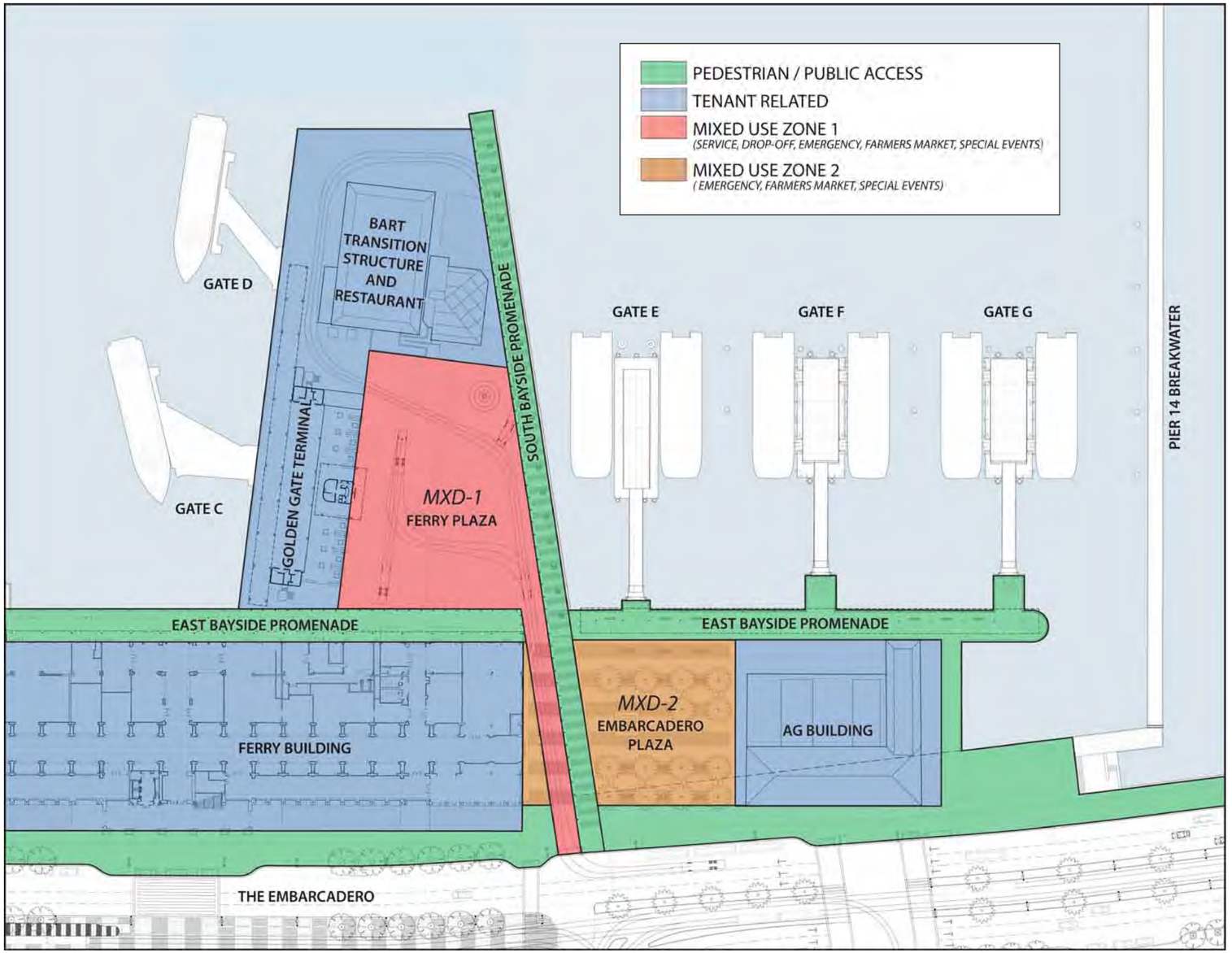


Figure 41: Preliminary Public Space Activity Program

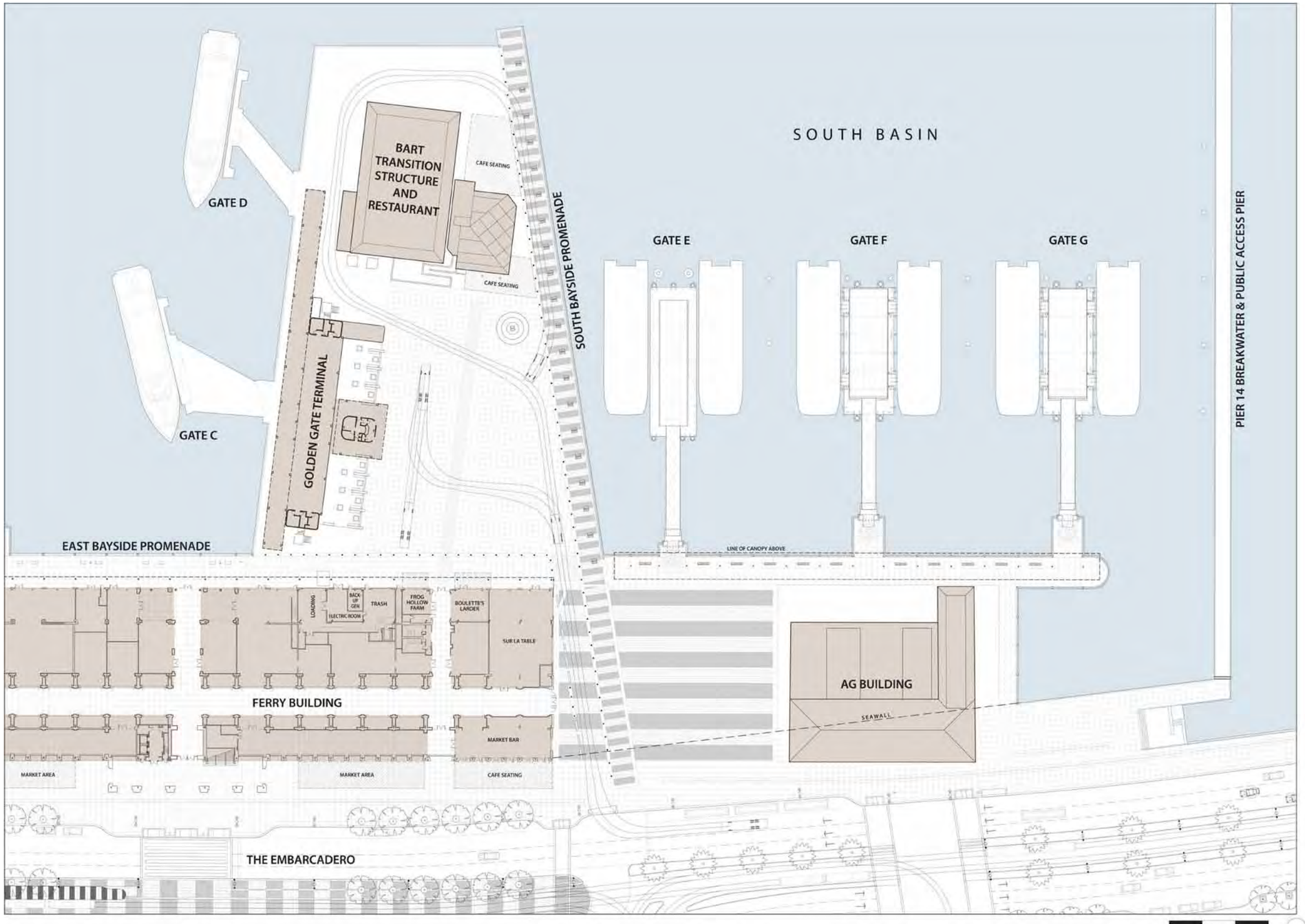


Figure 42: Preliminary Paving Plan

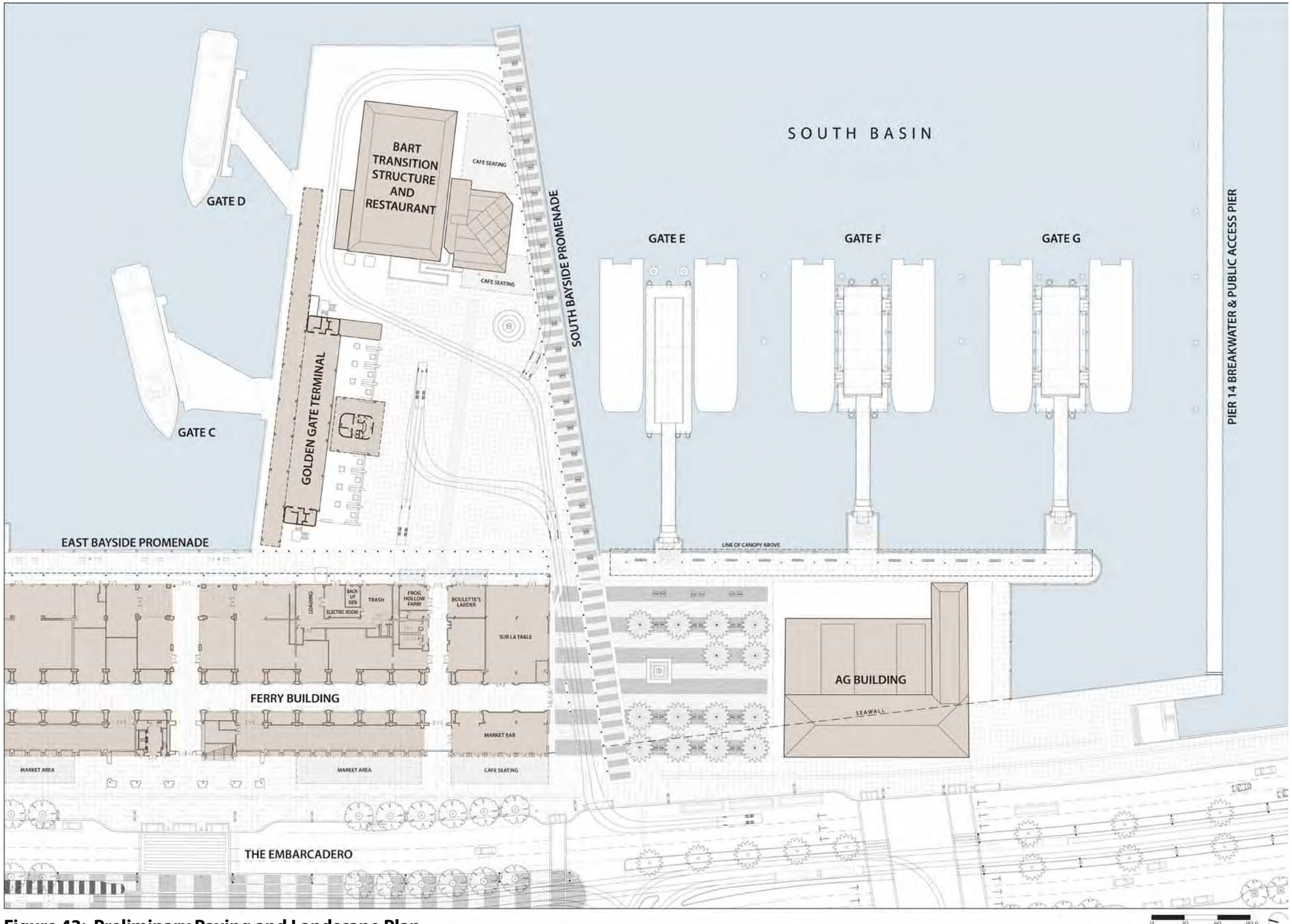


Figure 43: Preliminary Paving and Landscape Plan

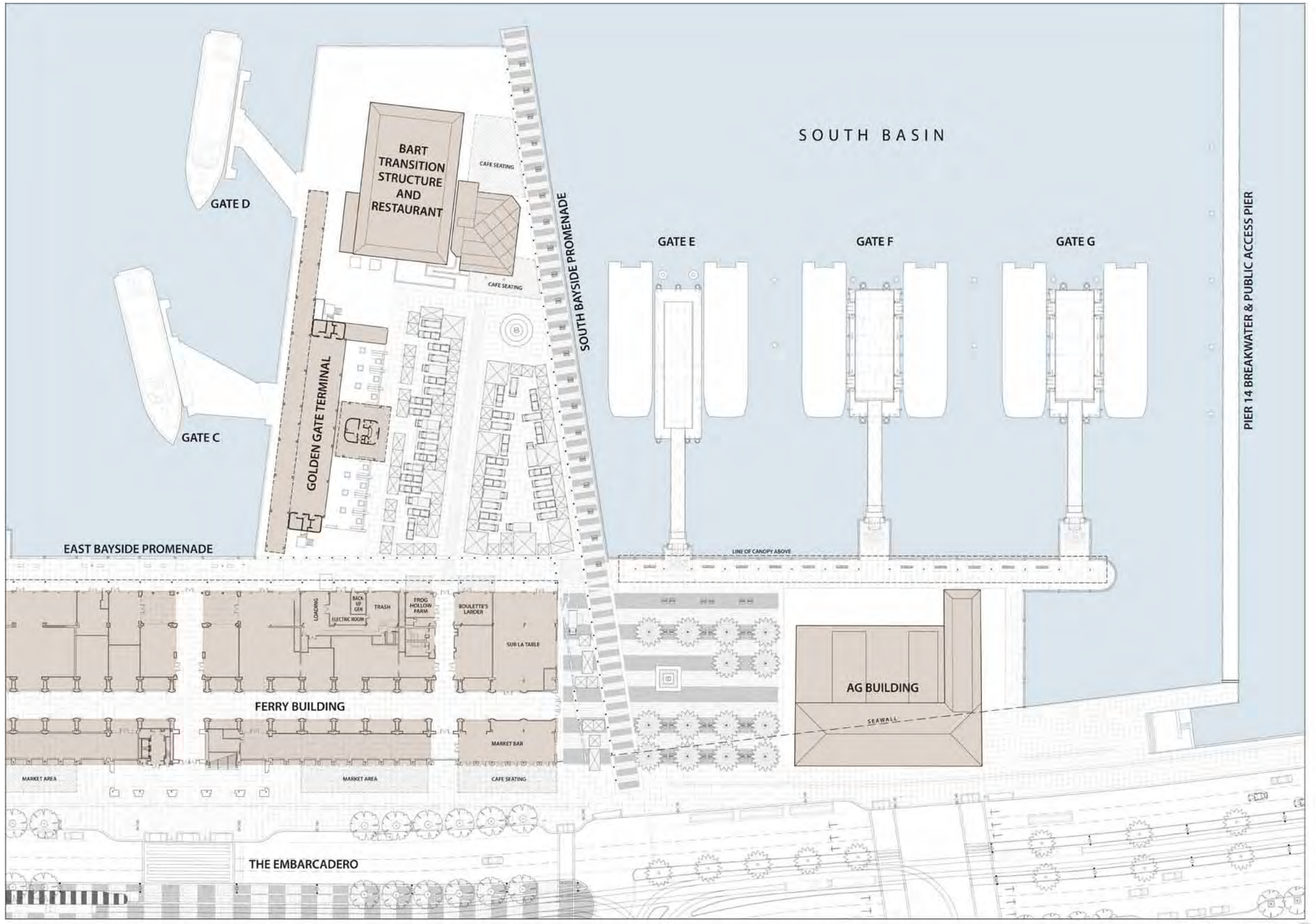


Figure 44: Preliminary Market Activity Plan

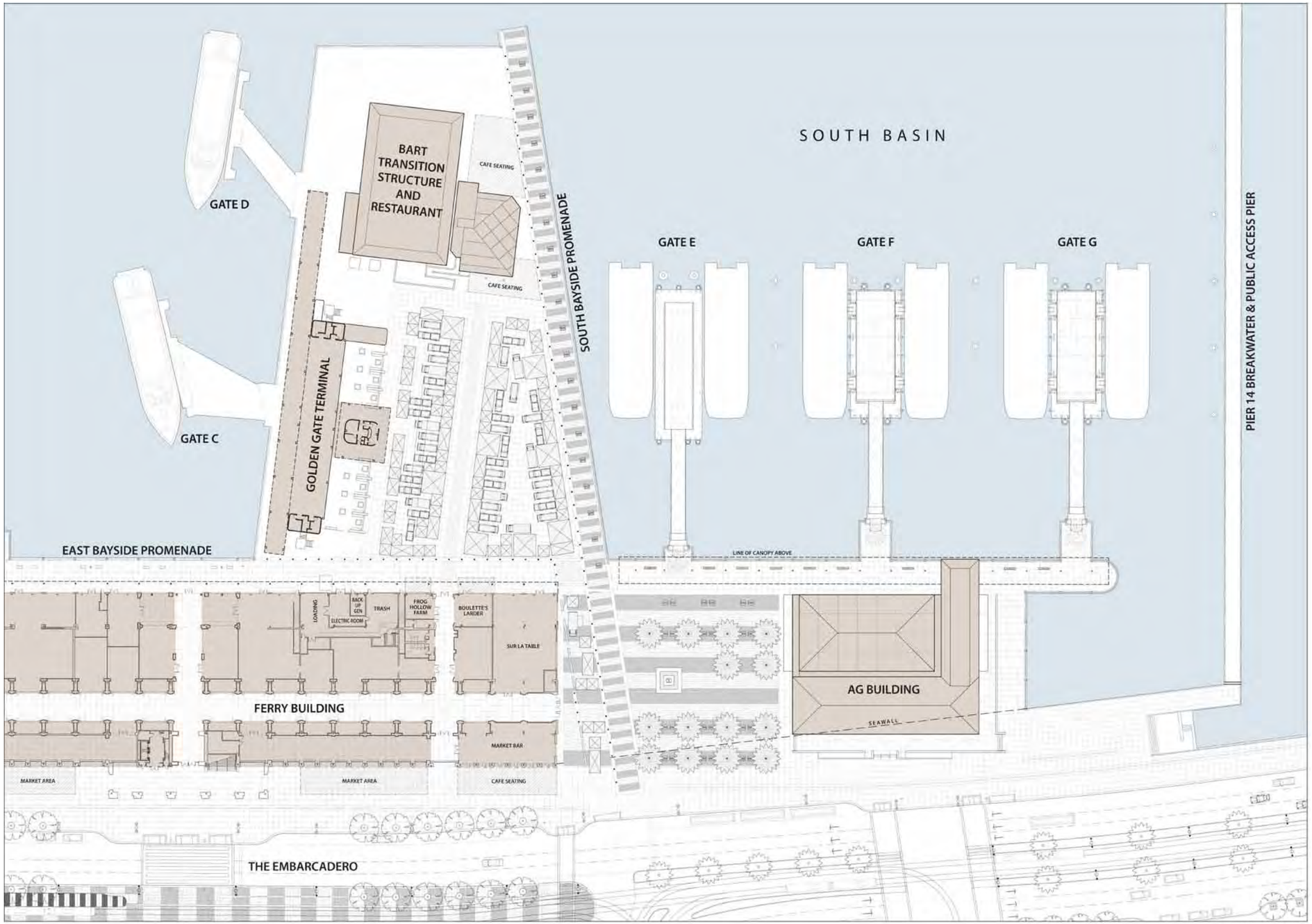


Figure 45: Preliminary Market Activity Plan with Future Agriculture Building Renovation

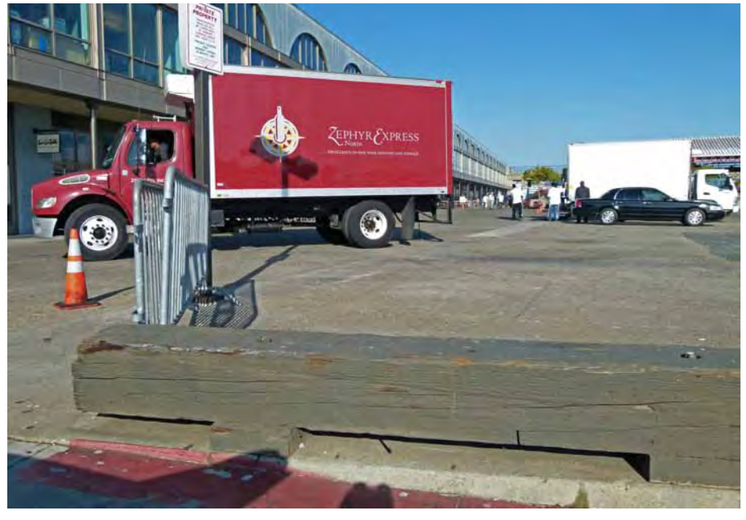
Ferry Plaza

The Ferry Plaza is the open pier area on the waterside of the Ferry Building. It is currently entirely committed under long term leases, either to Golden Gate Ferries, BART, Equity Office Partners (EOP), the developers of the Ferry Building, or the Ferry Plaza Limited Partners (FPLP), which controls the restaurant use associated with the BART transition structure. After the platform was built in the 1970's, Golden Gate ferries occupied a portion of the plaza with their facilities and a restaurant was built on top of the BART transition structure. The restaurant, which has had different tenants over the years, including Gabbianos Restaurant and the World Trade Club, is now being renovated for a new events and restaurant facility.

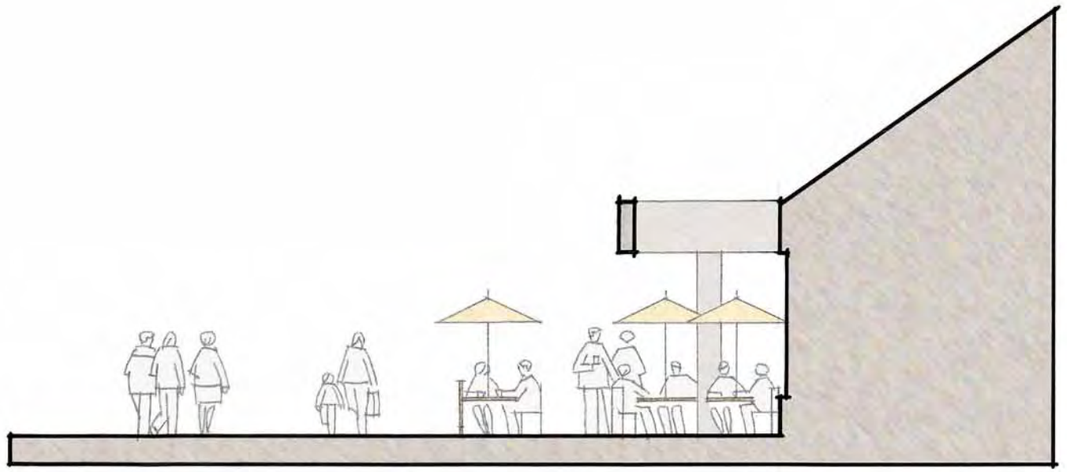
This space is needed for a variety of service delivery, emergency access, and drop-off functions. In recent years, the CUESA Farmer's Market has given new meaning and vitality to the Ferry Plaza and made it a major focus of activity on Saturdays, but public activity is very limited during the rest of the week, when the plaza is traversed by Golden Gate ferry patrons and occasional pedestrians walking around the Ferry Building area. Much of the area is also required BCDC dedicated public access resulting from the construction of the pier and the BART transition structure. Currently vehicles have access to all portions of the pier except for a 12-foot wide portion along the southern edge of the pier. There is no vehicular access during the Saturday Farmers Market (except farmers' trucks) when the entire plaza is taken over for market activities and in pedestrian use.

The Ferry Plaza calls for a better definition of the most valuable pedestrian areas; that is, the south edge of the pier and the east edge of the Ferry Building. It identifies a central area that would remain as a flexible space for a mix of vehicular and pedestrian activities. In addition to providing service access to the Ferry Building and drop-off functions for the FPLP restaurant as allowed for in their lease, the plaza would also continue to serve the Saturday farmer's market as well as special events. It is assumed that a new concrete topping slab would be provided as well as the potential for a special paving treatment might be used to accentuate the extension of the Ferry Building passageway and create a stronger connection to the eastern edge of the plaza. In addition, it is suggested that the statue of Gandhi be located on a new more engaging pedestal to an area further to the east and adjacent to the new South Bayside Promenade.

The Ferry Plaza serves of variety of essential functions for service delivery and emergency access. There are also lease commitments allowing vehicular drop-off for FPLP lease holders, the restaurant associated with the BART transition structure. It is also the location of the Saturday Farmer's Market which is one of the most successful public gathering spaces in the city. Furthermore, it also creates opportunities for a variety of special events.



Although delivery and service access are necessary and vehicular drop-off is provided for in the existing FPLP long term lease, some organizational aspects are needed to eliminate vehicular pedestrian conflicts and enhance overall environmental quality. In the past, many issues have been raised about the abuse of this area for vehicular parking, however it is important to note that design solutions need to maintain the flexible use of this area for a variety of functions and that appropriate management and policy enforcement are needed as well.



Section at FPLP restaurant with potential for cafe seating

Section at Ferry Building with designated promenade and cafe extension area

Figure 46: Edges

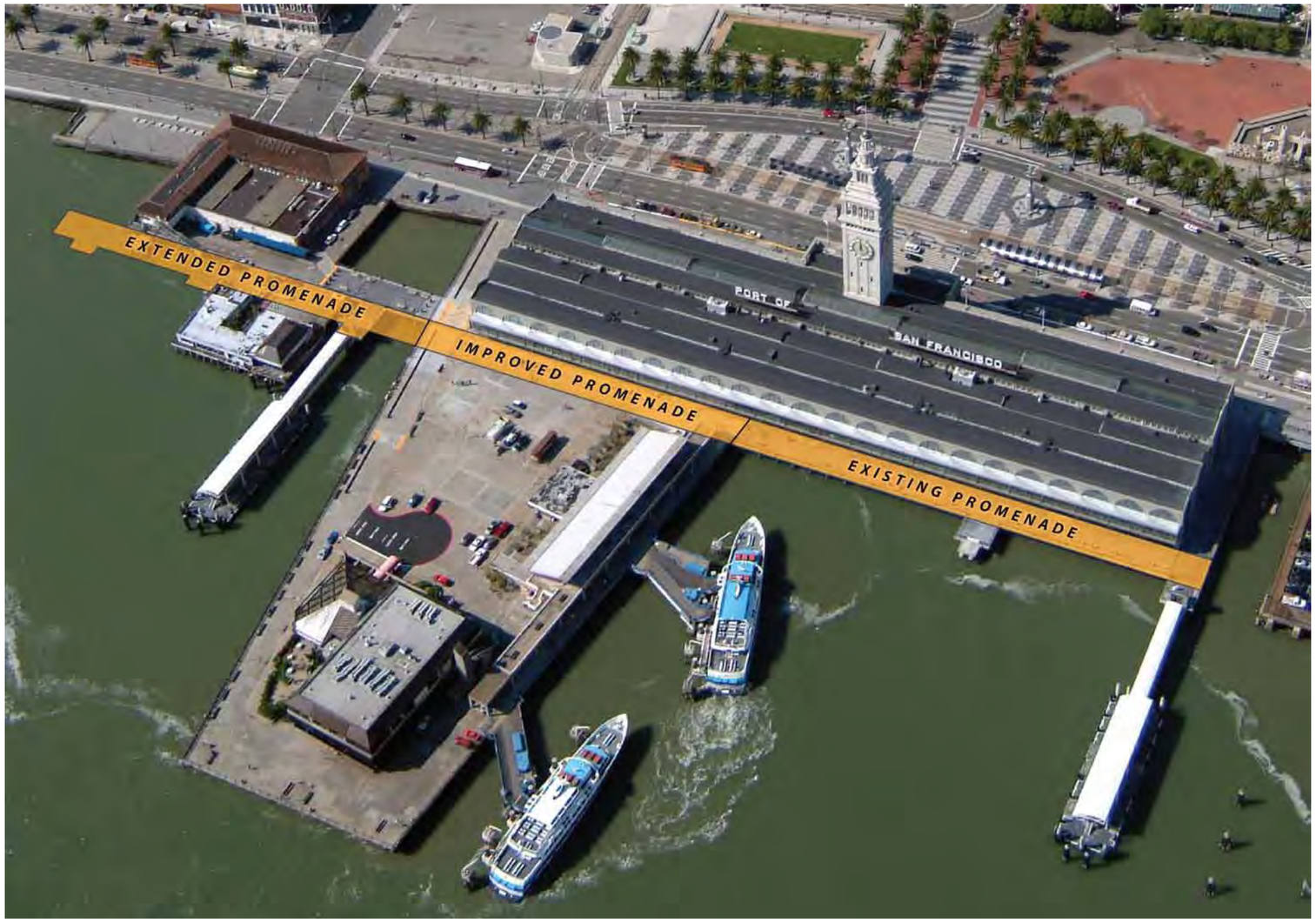


Figure 47: East Bayside Promenade

North of the Ferry Plaza, the existing improved Bayside Promenade is today an active public space that is used for promenading, viewing, and cafe seating. The promenade needs to be extended to the south adjacent to the Ferry Plaza to reinforce the path of movement, strengthen its continuity and to separate it from the adjacent service vehicular activities. Southward from the Ferry Plaza, the promenade is to be widened to align with the Phase 1 improvements to the north and extend southward to serve Gates F and G as well as the existing Gate E.

East Bayside Promenade

The East Bayside Promenade, from Gate B to the northern edge of the BART platform, was widened and improved as part of the improvements undertaken following the Loma Prieta earthquake. Since the Ferry Building opened in 2004, the East Bayside Promenade has become an active public space, providing for pedestrian circulation, viewing and general enjoyment of the bayfront as well as café extension areas. As previously discussed, improvements are needed to allow for a more appropriate extension of pedestrian circulation and activities from the promenade north of the Ferry Plaza through the Ferry Plaza and to Gates E, F and G. The concepts for the improvements of the East Bayside Promenade call for the extension of the Phase 1 design vocabulary to the treatment of the promenade portion of the Ferry Plaza and the new promenade that will interconnect the WETA ferry terminals. This vocabulary includes the use of the Embarcadero grey concrete paving with score joints at 5 feet on center, a metal painted decorative guardrail, wood slat traditional benches, and granite portal structures with a granite medallion at each gate. Adjacent to the Ferry Building on the Ferry Plaza, a continuous row of lighted bollards in a band of truncated domes is proposed to separate pedestrians and service vehicles and to provide a clear visual extension of the promenade path. As in the area north, south of the Ferry Building the design concept also calls for a new element to be added to the existing vocabulary - a high steel-and-glass canopy structure to interconnect Gates E, F and G, provide weather protection and give structure to queuing and waiting areas.

The extension of the East Bayside Promenade to the south is proposed to create activity linkages and pedestrian access to the existing and future ferry terminals. The promenade would be located and aligned so that it directly connects to the promenade to the north and a high and transparent canopy structure would be provided along the water's edge to organize passenger loading onto the ferries and to provide weather protection and transit signage for ferry patrons.

Figure 48: Ground level view of the extended East Bayside Promenade and the Ferry Terminal

Figure 49: South Bayside Promenade

The South Bayside Promenade would create a strong linear space that connects the Embarcadero all the way to the end of the BART platform. Currently an undefined space with substandard railings and lighting, it would be set aside as a 25-foot pedestrian space with improvements to paving, benches and lighting and a separation from the mixed vehicular space on the Ferry Plaza. With great solar exposure and spectacular views to the Bay Bridge, Treasure Island, Yerba Buena Island, the open water of the bay and the ferries moving in and out of the terminals, this promenade promises to become a popular destination and an important public access enhancement.

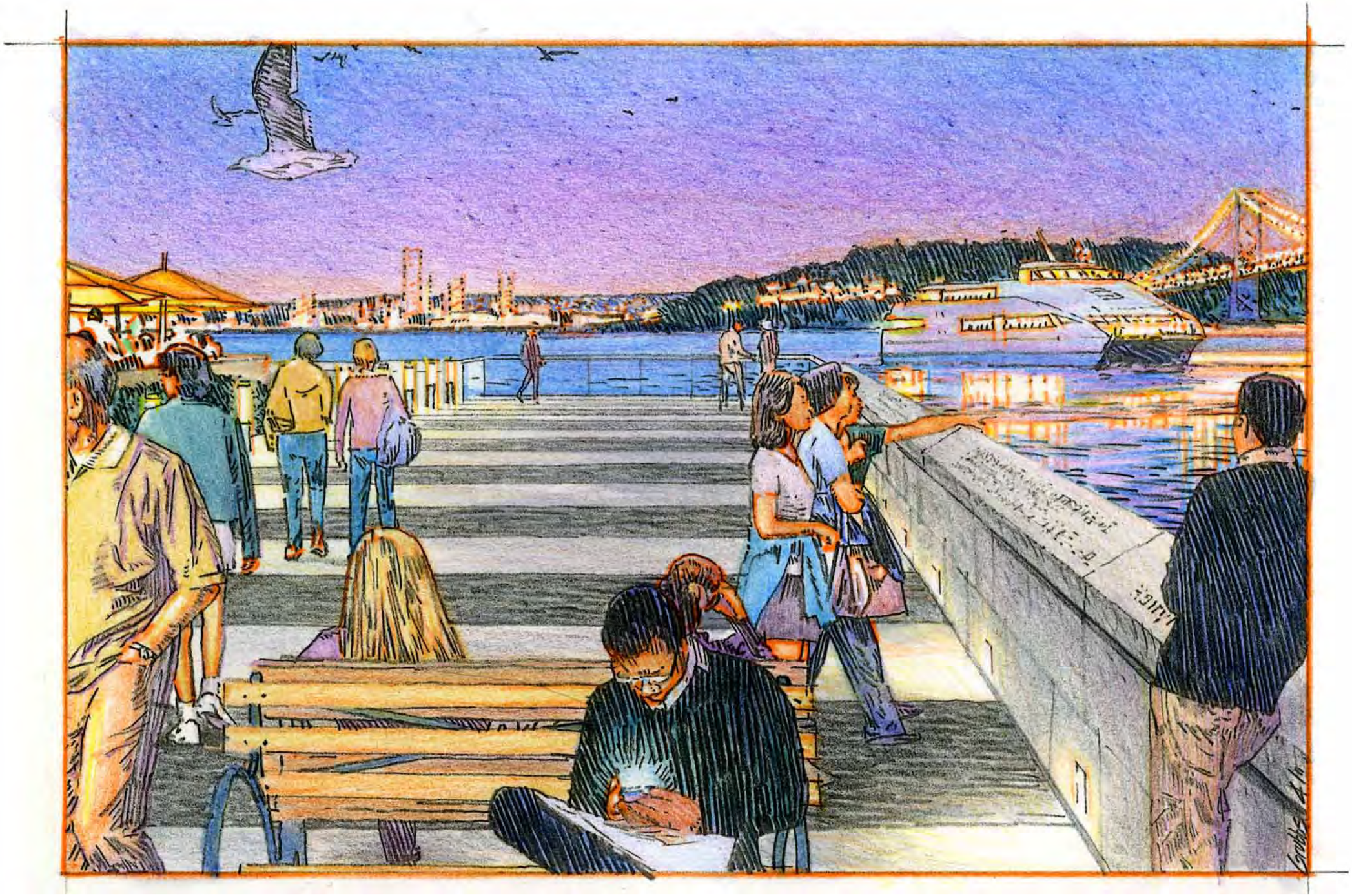
South Bayside Promenade

The South Bayside Promenade currently refers to the ill-defined and unimproved southern edge of the Ferry Building and Ferry Plaza that extends all the way from the Embarcadero to the end of BART platform. Despite spectacular views to the Bay Bridge, Yerba Buena and Treasure Island as well as to open water, the shipping channel and the ferry activities, the area today lacks spatial clarity and a sense of place. Currently, the area dedicated to public access and seating is narrow and "reads" like a roadway, with one-third of the area given to public access and two-thirds to the auto. Its roadway feel is exacerbated by the fact that it is at a lower elevation than the surrounding area and further by the fact that the raised pedestrian path built as part of the Phase 1 improvements is now used as the driveway for service vehicular access. Although seating is provided along the edge and the area has great solar exposure, it is generally unpopulated except on market days when vehicular movement is restricted and activities spill out to the edge. Improvements are needed to rebalance movement functions and give pedestrians the priority.

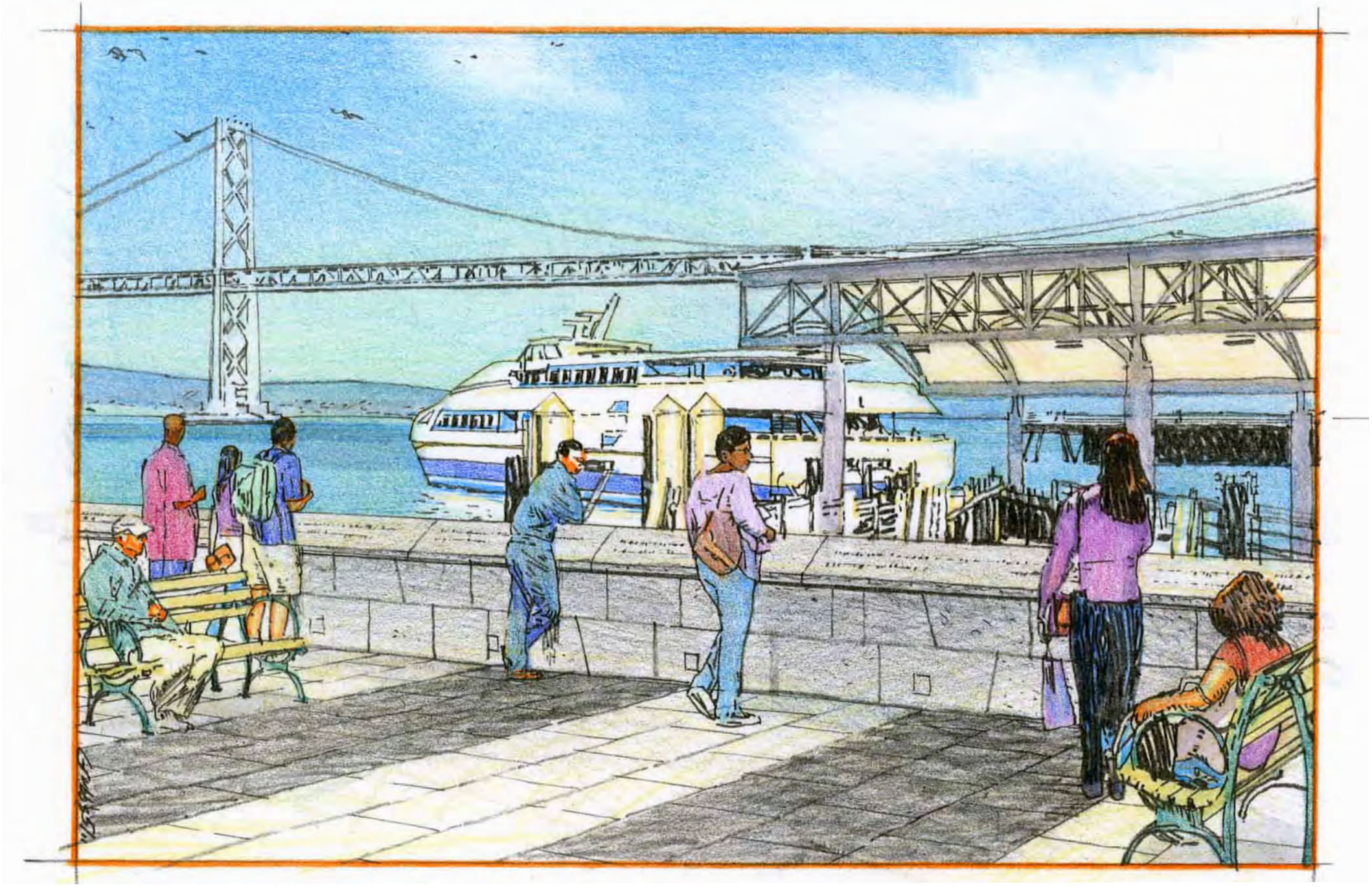
On either side of the Ferry Plaza, the promenade begins and ends ambiguously. On the Embarcadero side, the pedestrian path is not evident and to the east, much of the pathway is adjacent to or behind the BART transition structure. Despite spectacular views, the eastern edge is a no-man's land, tucked away and shielded from public view. Perceived as unsafe, it has become a hang-out for vagrants and is seldom used by others.

The concept is to create a clearly defined pedestrian promenade from the Embarcadero Roadway all the way to the tip of the BART platform (and slightly beyond it). The design and treatment of the promenade would reinforce the path of pedestrian movement with a bold graphic paving pattern. It would shift vehicular movement further from the bay edge and create a protected zone for sitting, viewing and walking adjacent to the water. In scale and linearity of treatment, it is anticipated that the improvements on the South Bayside Promenade would be reminiscent of pedestrian pier structures, like Pier 7 and Pier 14, that provide public access from the Embarcadero out to the pierhead line.

The above photos illustrate the existing conditions along the southern edge of the Ferry Plaza today. Except during the Saturday farmer's market shown at bottom right, the edge appears as a roadway, giving priority to vehicles rather than pedestrians.



Ferry Plaza Promenade: View to Treasure Island, Yerba Buena Island and the Bay



Ferry Plaza Promenade: View to Bay Bridge and South Basin Ferry Terminals

The concepts call for the improvement of all of the elements of the promenade, including paving, lighting, seating, guardrails and bollards which are either sub-standard or don't exist today. As a first step, the promenade would be set apart from adjacent areas by a distinctive paving pattern that recalls the carpeted path that was created as part of the Mid-Embarcadero improvements to punctuate the terminus of Market Street and its continuation as a pedestrian across the Embarcadero to the Ferry Building. Consistent with the Embarcadero improvements, the paving would consist of a combination of dark (Mesabi Black) and light (Rockville White) alternating granite bands.

Options for the treatment of the other elements have been considered and are illustrated on the accompanying pages of the report. A number of stone-clad, metal picket and combined stone/metal guardrail options with a variety of lighting choices have been presented. The traditional guardrail, which would be used in other parts of the Ferry Building area, is a metal picket with upright supports and bronze cap. Another option is the more modern guardrail with a horizontal metal banding and incorporating mid-height lights in the support elements. A third option considers the combination of metal rail with a lower stone-clad base and with pedestals supporting higher light fixtures. Finally, the fourth option is a distinctive stone clad guardrail that incorporates way-finding lights at the base and features interpretative inscriptions recalling the history of the downtown waterfront. This more solid and weighty guardrail would create a strong line that reinforces the edge of the bay, provides greater definition to the space and offers benefits in terms of greater wind and storm wave protection at the edge.

Although the options for lighting are shown in combination with the different guardrails, they range from being lower, way-finding lights, to higher post-top lights and from the more traditional to more modern. Options for seating include the traditional World's Fair bench, with wood slats, that are used elsewhere on the waterfront, to granite block benches that can be located to serve as an alternative to the lighted bollards in separating pedestrian and vehicular movement areas.

Following review and input, the options will be finalized and the elements would be composed to create a promenade that not only provides for dramatic views but an inviting environment for pedestrian movement and the public use and enjoyment of the bay.

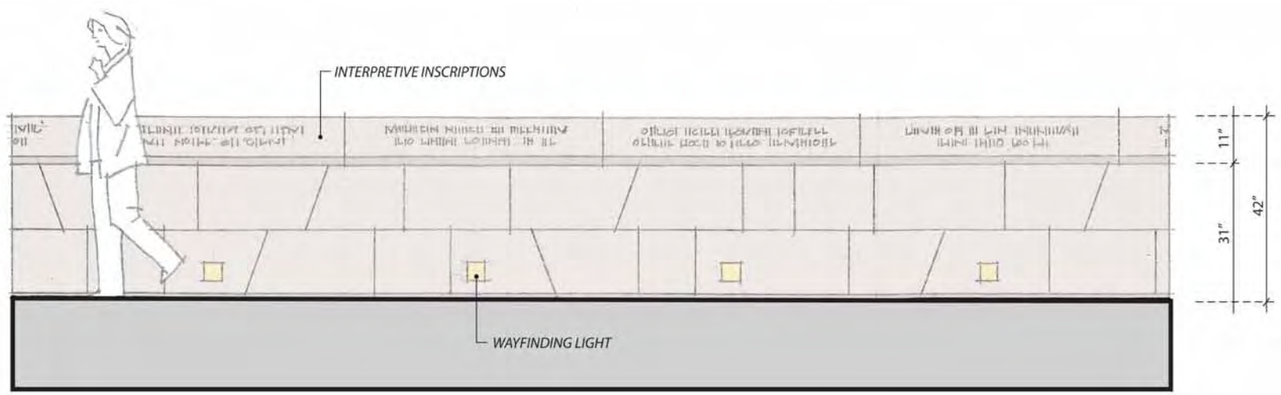


Figure 50: Guard Rail Option - Type A, Typical Elevation of Promenade Edge with Unique Granite Rail

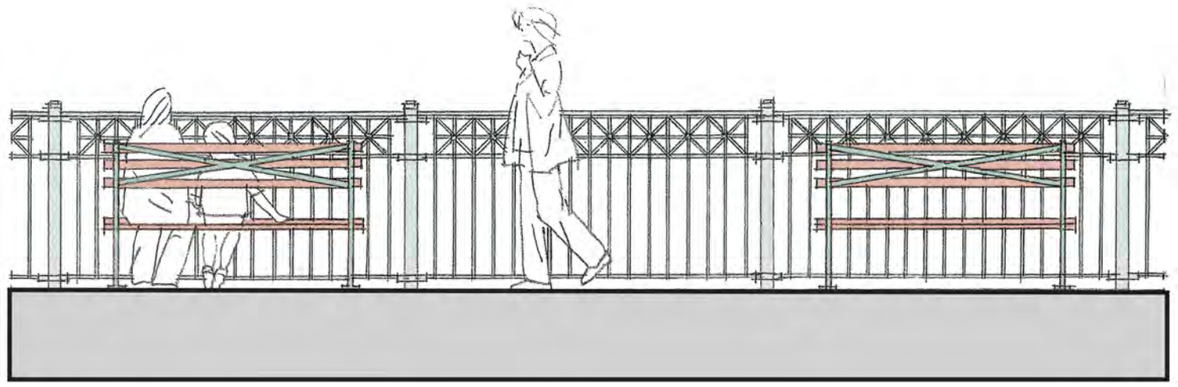


Figure 51: Guard Rail Option - Type B, Typical Elevation of Promenade Edge with Existing Vocabulary of Benches and Guard Rails

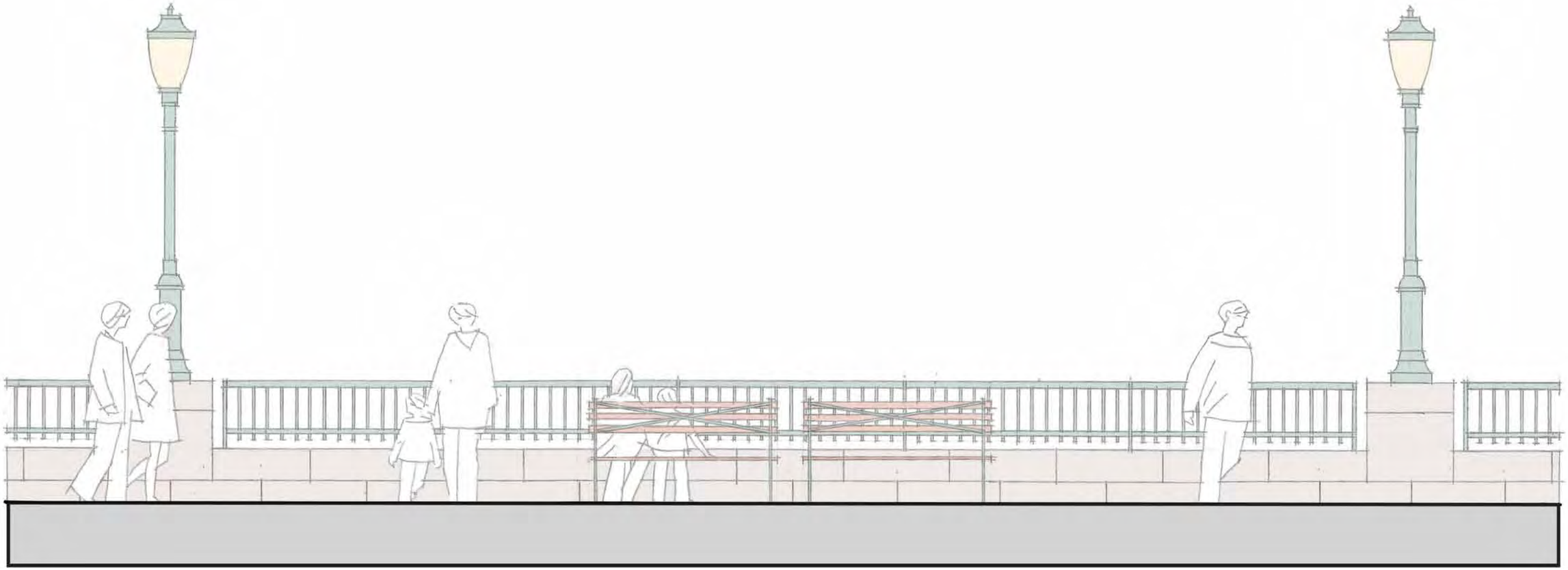


Figure 52: Guard Rail Option - Type C, typical elevation of Promenade edge with a granite and metal rail and traditional post-top lights

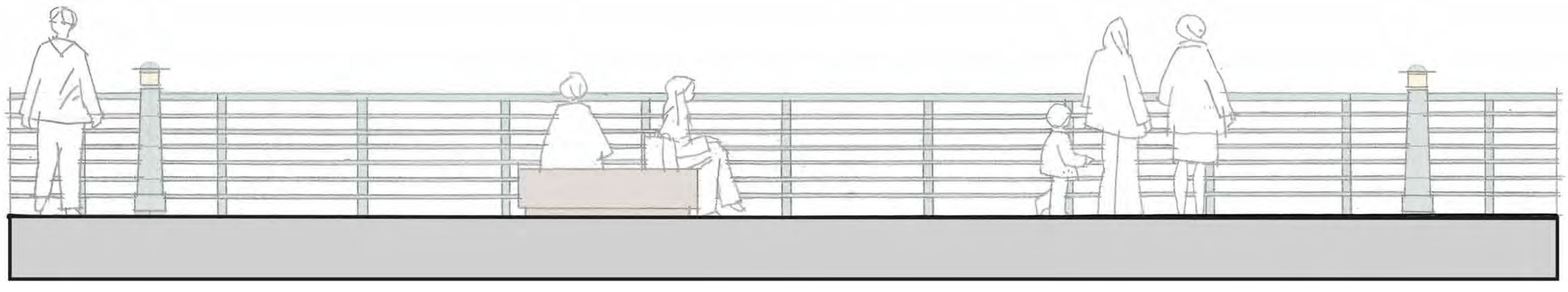
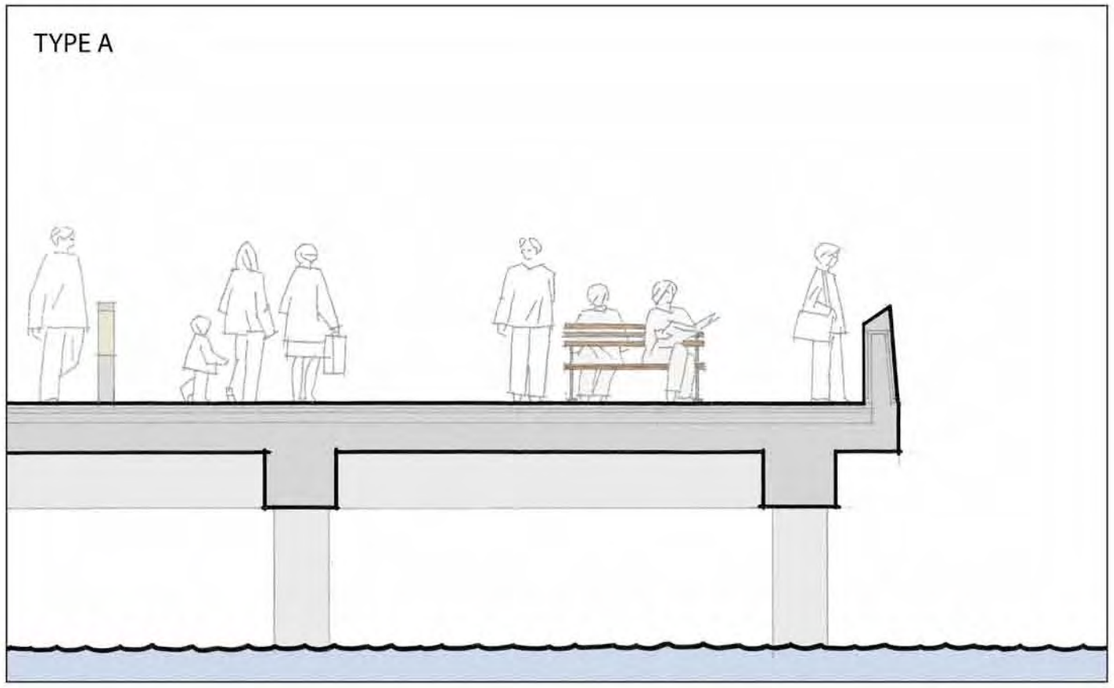
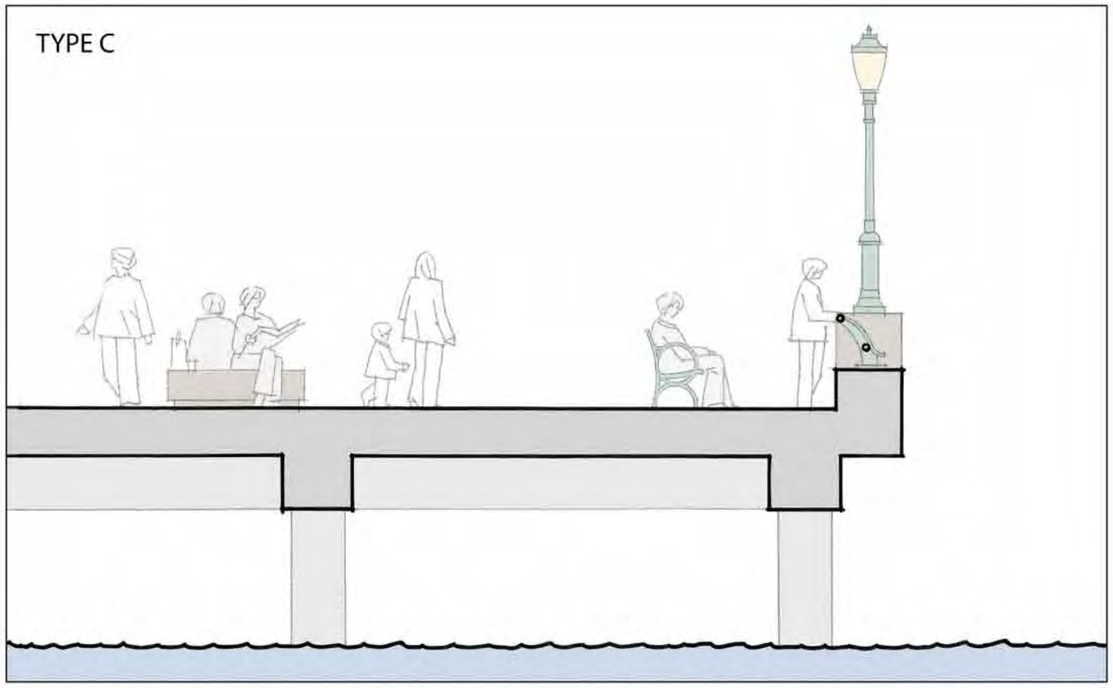
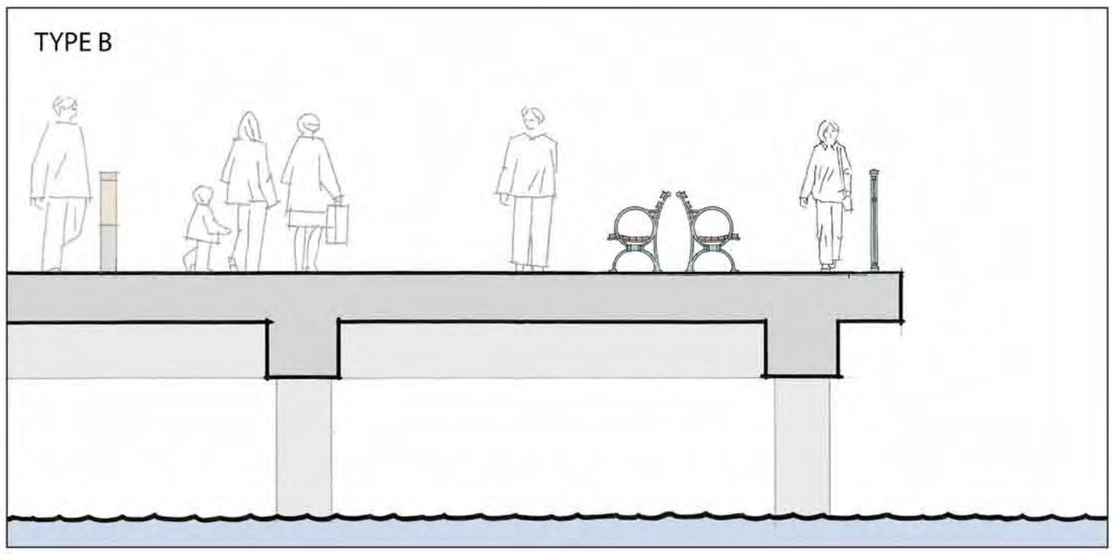


Figure 53: Guard Rail Option - Type D, typical elevation of Promenade edge with metal rail, integrated with mid-height bollard lights







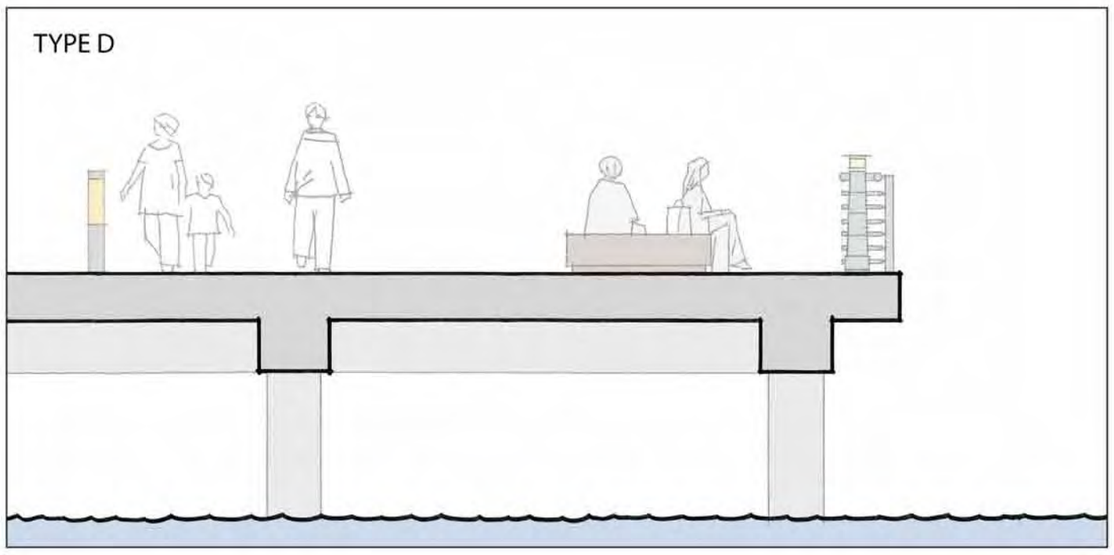
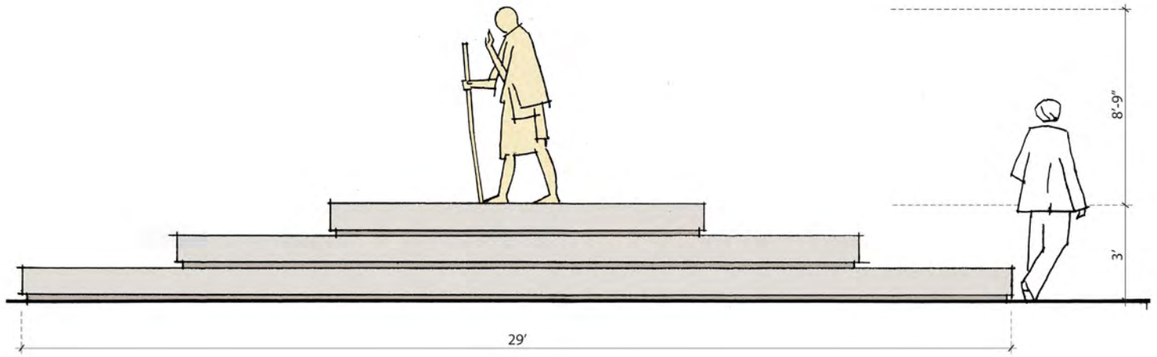
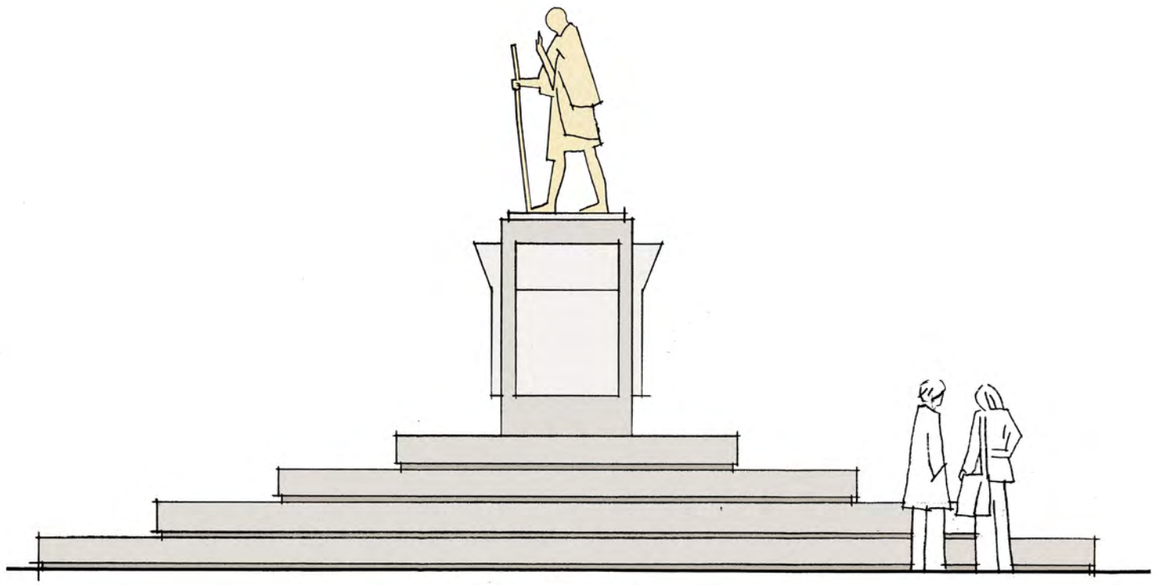
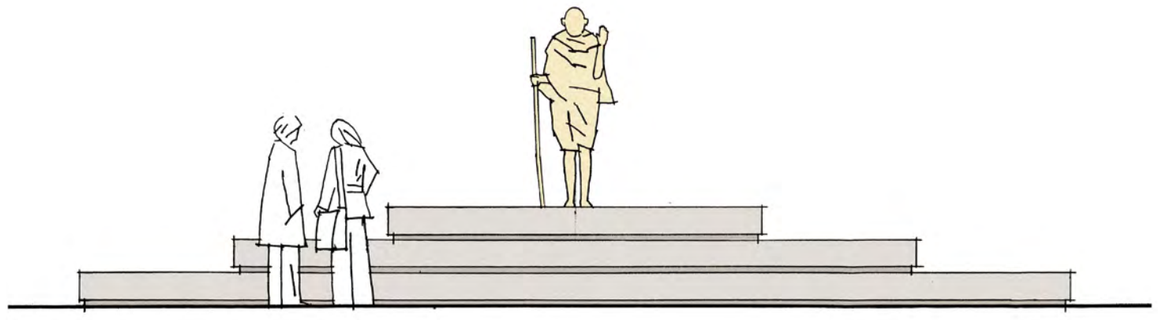


Figure 54: South Basin Promenade Cross-Sections with Guard Rail Options

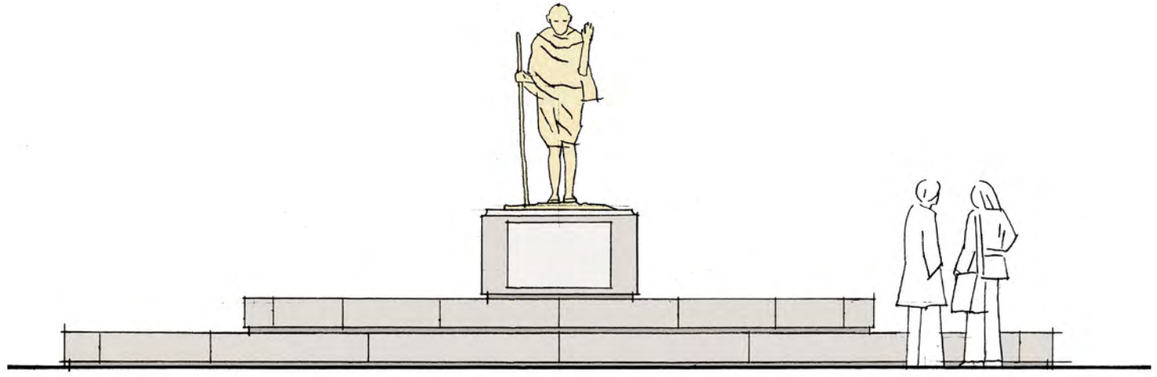




HIGH PEDESTAL



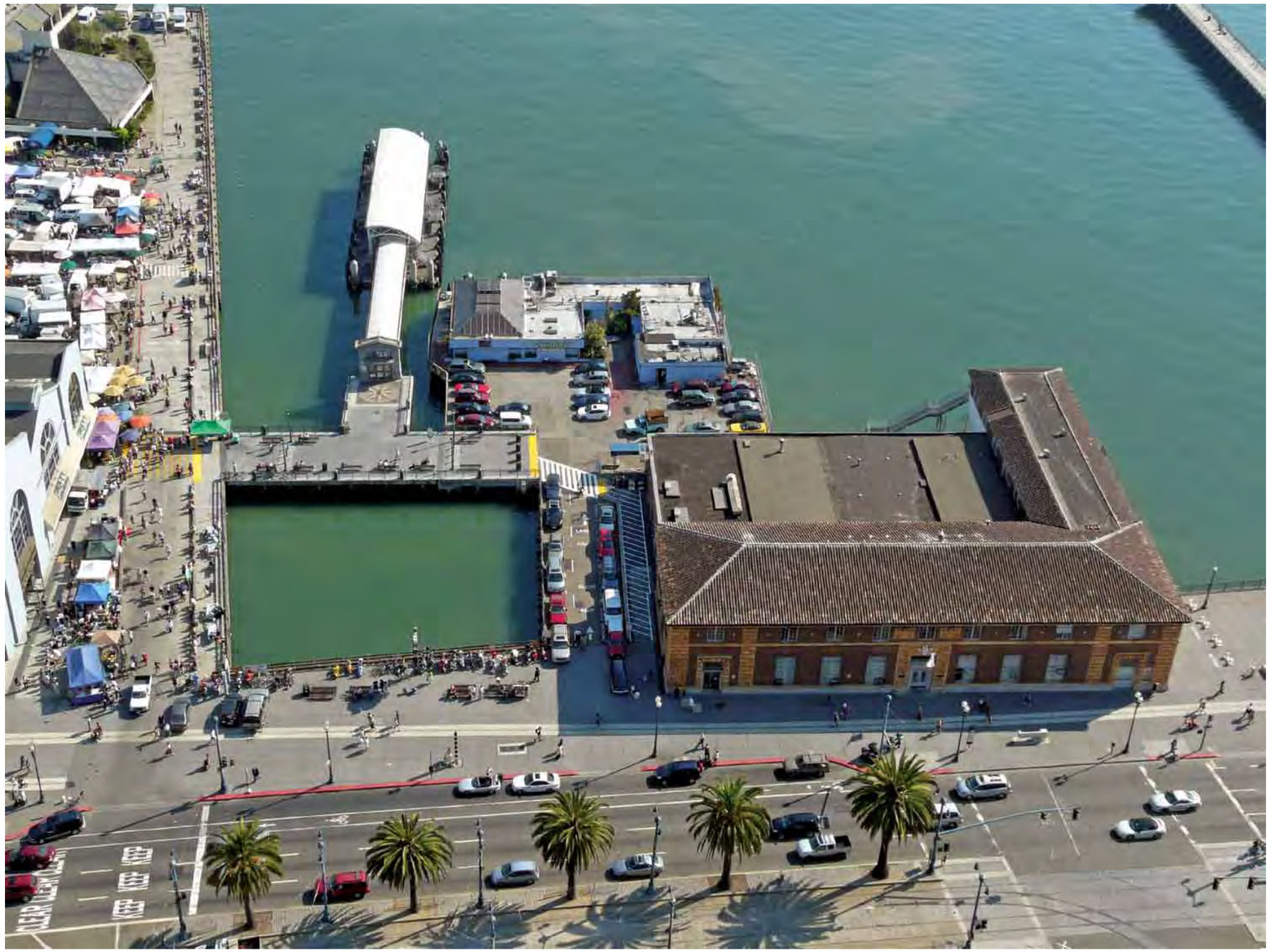
LOW PEDESTAL



MEDIUM PEDESTAL

Figure 55: Gandhi Statue Options

Options have been studied for the location, height and pedestal design of the Gandhi statue that would work better with existing and potential activities. Of the options illustrated above, it is recommended that the low pedestal option seems most in keeping with the scale of the sculpture and the meaning that it evokes. It also would create an area that would allow for informal seating. As indicated in the plans, the statue should be relocated mid-point along and adjacent to the new South Bayside Promenade where it will be more visible and where it can engage more directly with pedestrians and the activities along the bayfront.



The filling of the lagoon would improve pedestrian circulation and emergency support related to ferry service and enhancements of the space potentially include paving, sculpture, and landscaping that unifies the area and strengthens its relationship to the existing Mid-Embarcadero public space improvements. A grove of palm trees would provide scale and ameliorate the qualities of the space without impinging on its flexibility and potential future use.

Embarcadero Plaza

The Embarcadero Plaza is the area between the Ferry Building and the Agriculture Building which would result from the filling of the lagoon for improved pedestrian circulation, queuing and waiting areas and emergency response. This space would also provide for a better linkage between activities in the Ferry Building and those in a future renovated Agriculture Building.

Concepts for public space improvements in this area provide for a visual connection between the Ferry Building and the Agriculture Building as well as between the Embarcadero and the Bay. The new Embarcadero Plaza could become an iconic destination complementing the historic character of the area and bringing a civic quality to the open spaces between the Ferry Building and Agriculture Building. It could also extend the market activities of the Ferry Plaza to the Embarcadero, giving them greater visibility and allowing for a better distribution and organization of functions.

A number of physical improvement concepts have been considered for this area, including: the provision of enhanced granite paving in a pattern similar to the plaza in front of the Ferry Building; the inclusion of a major sculptural focal element; and a grove of palm trees that would both provide scale and ameliorate the qualities of the space without impinging upon its flexibility and potential future use.

A number of physical improvement concepts have been considered for the treatment of this area. They include enhanced paving, utilizing a pattern similar to the plaza in front of the Ferry Building with either all granite pavers, or a combination of granite and Embarcadero grey concrete; or all Embarcadero grey concrete. The improvement of the plaza could include a stature or sculpture or it could not. If a sculpture is incorporated, it should be of an appropriate scale and oriented to the history of the waterfront, possibly using the statue of Harry Bridges, currently planned to be located in the plaza across the street.

Options for adding landscaping have also been considered, in particular a grove of palms capable of providing a sense of structure, scale and civic identity, particularly needed when no activities are taking place within the new plaza. The palms would serve as part of the storm water management and sustainability of the area, slowing down storm water run-off and providing filtration and treatment for improved water quality.

Embarcadero West Ferry Plaza

Figure 56: Option 1 - Embarcadero Plaza. *This oblique view illustrates how the area that is required for improved pedestrian circulation, queuing, waiting and emergency response might also include a civic or iconic element, such as a statue.*

Figure 57: Option 2 - Embarcadero Plaza. *This oblique view illustrates how the area that is needed for pedestrian circulation, queuing, waiting and emergency response might also be used as an extension of the farmer's market during non-commute hours.*

Figure 58: Option 2- Embarcadero Plaza. *This oblique view illustrates how the area that is needed for pedestrian circulation, queuing, waiting and emergency response might also include palms to frame the plaza space with a new statue in the center.*

Figure 59: Option 3 - Embarcadero Plaza. *This oblique view illustrates how the area that is needed for pedestrian circulation, queuing, waiting and emergency response might also include landscaping that maintains the flexibility and utility of the plaza area but creates a more civic quality and an amenable open space.*