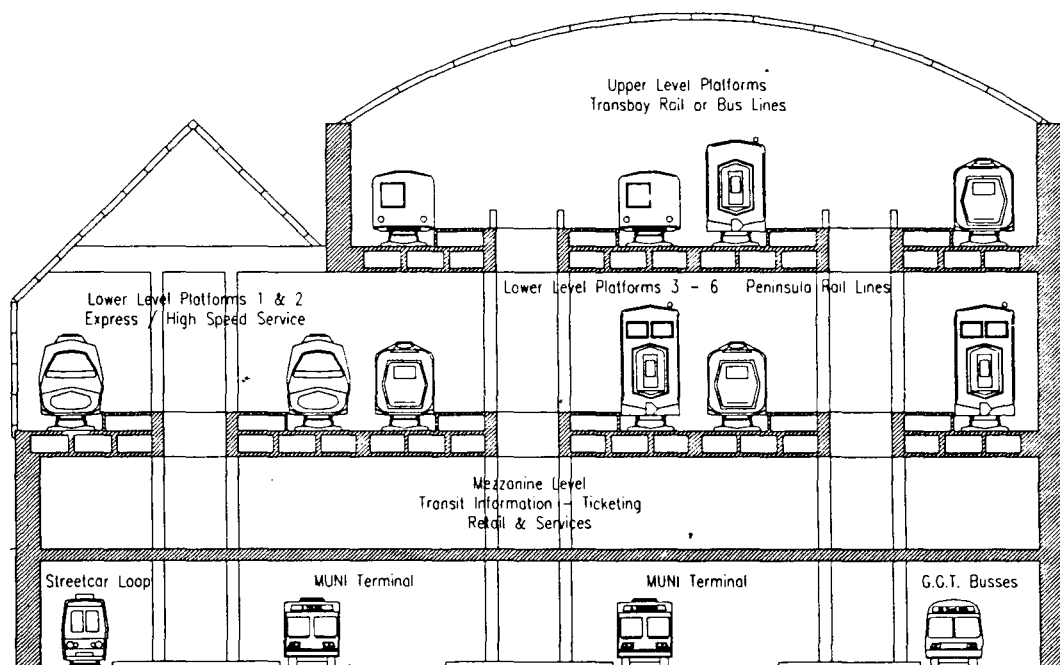


**CalTrain Peninsula Commute Service
San Francisco Downtown Terminal Relocation Study
Emperor Norton Proposal**

March 1993

**Michael Kiesling
*Architecture 21***

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Proposed Downtown Terminal

Alternative Comparison Matrix

Alternative Name (Sponsor)	4 (JPB)	5A (JPB)	5B (JPB)	Civic Center (Haas)	Norton (Kiesling)	5D (Van Pelt)
Terminal Location & Route	2nd & Market via King/2nd	TBT Adjacent via King/Embarcadero	TBT Adjacent via King/2nd	7th & Market via 7th	TBT (New) via Rincon Tunnel	TBT (Existing) via King/Embarcadero
Terminal Type	Underground	Underground	Underground	Underground	Elevated	Elevated
AC Transit Interface & Routes	850' All S.F. Lines	Yes All S.F. Lines	Yes All S.F. Lines	N/A	Yes All S.F. Lines	Yes All S.F. Lines
Golden Gate Transit & Routes	850' All S.F. Lines	Yes All S.F. Lines	Yes All S.F. Lines	Yes Some Lines	Yes All S.F. Lines	Yes All S.F. Lines
Mission Bay Station	4th & King	4th & King	4th & King	7th & Channel?	4th & King	4th & King
Embarcadero Station Interface	N/A	1250'	1250'	N/A	1100'	1100'
Montgomery Station Interface	Yes	950'	950'	N/A	750'	750'
Powell Station Interface	N/A	N/A	N/A	1600'	N/A	N/A
Civic Center Station Interface	N/A	N/A	N/A	Yes	N/A	N/A
MUNI Bus Line Terminal Site	No	Yes	Yes	No	Yes	Yes
Storage Facilities Adjacent	No	No	No	No	Yes	No
Joint Development Opportunities	No	Yes	Yes	Yes	Yes	Yes
Private Property Condemnations	Some	Many	Many	Many	One?	?
Conflicts w/ 7th & Townsend Ballpark	Yes	Yes	Yes	Yes	No	Yes
Construction Impacts (1-low 6-high)	5	4	6	3	1	2
Major Impact	Construction	Site Assembly	Site Assembly	Site Assembly	Elevated Viaduct	Alignment
Relative Cost (1-low 6-high)	4	6	5	2	1	3
Compatibility w/ through service	No	No	No	?	Yes	?

The Emperor Norton Project

Questions or Comments:

Michael Kiesling

Architecture 21

750 Columbus #3

San Francisco 94133

415 - 399 - 9559

"What if all the transit systems in the Bay Area were connected? ... More than \$2 billion has gone into today's product, but the most elementary ingredient is missing - interconnection."

-Sanford Horn, *San Francisco Sunday Examiner & Chronicle* April 24, 1983

In late April of 1983, an article was printed in the California Living section of the Sunday Chronicle and Examiner. It laid out how the trains of the Peninsula Commute System, or CalTrain, could integrate with the BART system by building a new terminal for the trains in Downtown San Francisco. In 1988, the Metropolitan Transportation Commission, the regional agency in charge of allocating transportation funds, passed Resolution 1876.¹ The resolution called for the funding and construction of a downtown terminal for CalTrain to coincide with the funding and construction of a BART extension to the San Francisco Airport. This action provided the regional commitment to build a downtown railway terminal in San Francisco. But today, in 1992, BART's airport extension is progressing smoothly, but a downtown terminal for peninsula commuters seems no closer that it was ten years ago.

In the tight economic times everyone faces today, public funds are stretched to the limit. A downtown terminal for CalTrain is not high on public officials' list of priorities. The body which operates the railway, the Joint Powers Board, is comprised of government officials from the counties through which the train passes. While the members of the board work diligently to operate and improve the railway, they do not have the strong administrative support that other transit agencies have. BART has assembled billions of dollars in funding for its projects because it has a huge staff dedicated to operating and improving its railway. When in competition for public funds, the Joint Powers Board is sadly overmatched as it competes with BART for public funds.

The proposal outlined in this report emanates from a re-examination of the factors preventing the construction of a downtown terminal for CalTrain in San Francisco. It proposes a radically new approach to the funding and construction of the extension, encompassing new opportunities for a public - private joint venture to build and operate the terminal. It also provides San Francisco with the opportunity to take the leadership role in the project. By taking an active role in the project, San Francisco not only aids in the construction of an invaluable regional transit project, it gains the opportunity to plan and develop a smooth transition between the emerging Rincon Hill residential area and the growing commercial area surrounding the Transbay Terminal and Embarcadero.

The ability for the peninsula transit system to be integrated with the BART system should be the region's number one transit priority. This proposal recognizes that and attempts to go beyond that goal to offer the public a project that has the ability to be one of the greatest integration of transportation projects ever conceived, offering San Francisco and the Bay Area the transportation hub they deserve.

History of the Downtown Terminal Project

Almost ten years have passed since the first public proposal for the extension of the Peninsula Commute System to the Transbay Terminal. Since that time, the plan has been studied and reworked many times, with each version costing more than the previous. As the price grows and time passes, support for the plan drops. Today, the plan languishes because two of the three counties that comprise the Joint Powers Board, which runs the railway, are unwilling to commit local transit dollars to a regional project.

This conservative approach to the Downtown Extension is leading the entire Bay Area towards a dangerous precedent, the belief that only BART can provide the region with a viable transportation system. Since the 1988 adoption of MTC Resolution 1876, public support is a major component in the force which propels BART's extension plans to the San Francisco airport. People around the Bay region are familiar with BART, and they understand the need to provide rail service to major regional destinations.

¹Resolution 1876, New Rail Starts Program, was passed to guide the construction of major rail projects in the Bay Area into the 21st century. It provided funding agreements that allowed East and West Bay rail projects to be funded simultaneously. San Mateo County transit money was used to start BART extensions in the East Bay, in exchange for a BART extension to SFO.

BART supporters have used the public's limited knowledge of transportation systems to support their argument that only BART can solve the region's transportation problems.

San Francisco occupies both an unique and uncomfortable position. While the entire CalTrain extension project is located entirely within the City and County of San Francisco, it currently appears that the city will be unable to commit to pay its share of the project. San Francisco's transit priorities are based on the needs of the residents of the city, not the commuters who travel into the city each day. While a proper downtown rail terminal is a necessity in any of the world's major cities, it is not likely that the city will delay planned MUNI railway extensions along Third Street or out Geary Street to pay for construction of a railway extension that will mainly serve residents of other counties.

This position will cause San Francisco to bear the brunt of regional public outcry if the Downtown Extension does not proceed. Santa Clara already has indicated that its financial commitment is contingent upon San Francisco's financial participation in the project. So far, only San Mateo County has committed funding for the extension. The Joint Powers Board has announced that without funding commitments for the entire project, progress on the extension is in danger of stopping. This cannot be allowed to happen.

Without a downtown terminal for its trains, the Peninsula Commute System will never be able to attract the number of passengers that it needs to make the jump to a level of service equal or better than BART's. Residents of the peninsula will have to wait well into the next century for a multi-billion dollar BART extension through their county.

As the Joint Powers Board begins to look for different ways of funding and building the extension, the time has come for San Francisco to come forward to take the lead role in getting this important regional transportation project built. But the Downtown Terminal project that San Francisco should support must be more than an expensive tunnel to Market Street. The conditions in the downtown area are radically changed from when the current proposal was designed, due to the destruction of the Embarcadero Freeway and its ramps by the Loma Preita earthquake in 1989. Today, an opportunity exists to bring the trains from the Peninsula directly into the Transbay Terminal, above grade. This would create a true regional transportation center, serving as the hub for passengers from both the Peninsula and the East Bay.

The Norton Project

The Loma Preita Earthquake has presented San Francisco with a great opportunity to heal many of the wounds that the State Division of Highways and Caltrans had inflicted over the years. Today, the city plans a great plaza and boulevard for the area where the Embarcadero Freeway once stood. The city also has the opportunity to recapture the northern slope of Rincon Hill, where the Terminal Separation ramps now await demolition and build a centerpiece for the Bay Region's rail systems.

Before October of 1989, the Terminal Separation Structure carried traffic between the Bay Bridge and the Embarcadero Freeway. These ramps, planned in the late 1940's and built in the early 1950's were to be a major link in the West Bay's freeway network. They were designed to provide motorists from the Peninsula and the North Bay a connection between the Embarcadero Freeway and the Bay Bridge. At that time, the Embarcadero Freeway was planned to reach from the Golden Gate Bridge to Highways 101 and 280 on the Peninsula.²

While these freeways were only partially built, the Terminal Separation was a valuable connection between the Bay Bridge and Downtown. Currently, Caltrans plans to demolish and then completely rebuild the structure as it existed before it was fatally damaged in the earthquake. The plans call for the new structure to follow the exact path as the original, with the only change being a provision for a single level connection to the planned Embarcadero Boulevard. The width of the proposed ramps will actually be wider than what was once there. At the informational meeting that Caltrans held to present the project to the public, Caltrans planners stated that no thought has gone into the alignment or layout of the new \$100 million project because, "That is not our job." At this point, the only objective that Caltrans has is to rebuild its damaged freeway.

Caltrans, along with many of the agencies that support it, is coming under increasing criticism for being so blatantly "pro-freeway". Their handling of this project shows the shocking arrogance that has earned them their "pro-freeway" reputation. It is senseless that they are ready to spend \$100 million to reconstruct a freeway that was designed almost 50 years ago, a freeway that today leads nowhere, without any attempt to see if it is the right plan for today. While the original structure was to connect the Bay Bridge to an eight lane interstate freeway leading to the Golden Gate Bridge, the replacement structure will at best serve as the approach to a six lane city boulevard.

Once Caltrans' contractor has demolished and cleared the old Terminal Separation Structure from where it now stands, many acres of prime downtown land will be opened up. San Francisco must act now to see that this land which was taken from it over 40 years ago be put to a better use than Caltrans now proposes. Planning decisions made in the late 1940's cannot be used to justify the reconstruction of the Terminal Separation Structure as it existed before the Loma Preita earthquake.

Background

Since the 1930's, the State of California has condemned many acres of property on Rincon Hill for two major transportation projects. The first condemnations were carried out in the early 1930's, as part of the

²In the early fifties, freeways were planned all along the Embarcadero and through the Marina, through the Mission District, and across Golden Gate Park. These plans were all eventually abandoned, leaving today's remaining freeways to act only as long off-ramps.

construction of the Bay Bridge. The second wave of condemnations came in the mid-50's, when the state acquired land for the Terminal Separation Structure. These condemnations were much more extensive than the earlier set, and resulted in a much greater division of the neighborhood through which they were made. In late 1993, when most of these properties have been cleared, the presence that the state holds in the Rincon Hill area will be clearly shown.

The opportunity that thoughtful redevelopment of this property holds presents a tremendous opportunity to create an entire new district in San Francisco, centered on a new regional rail terminal. By combining the continuing redevelopment of Rincon Hill, the construction of a new boulevard to the Bay Bridge, a regional rail terminal, and possibly a downtown Sports and Convention Arena, the city has a chance to provide a focal point for its future downtown development.

It is simple to realize the potential that a well planned replacement for the Terminal Separation Structure holds. All of the land now covered by highway ramps could accommodate a project almost twice the size of the 6 block Embarcadero Center. San Francisco must take a strong stance against Caltrans' current plan for reconstruction of the Terminal Separation, enabling this valuable downtown property to be redeveloped to provide more than just a ramp to the Bay Bridge.

While it is foolish to propose that none of the bridge ramps be rebuilt, it is possible to provide a new boulevard connecting the Bay Bridge and Skyway to the Embarcadero that would only cover a fraction of the land now occupied by the Terminal Separation. A new alignment of the approaches would also accommodate both an above ground route into the Transbay Terminal for the Peninsula Rail System, and ramps connecting a Bay Bridge rail system to the Terminal. Both of these key projects for interconnection between the region's rail systems are known to the public, but Caltrans has chosen to ignore them because, "That is not our job."

The reconstruction of the ramps from the Bay Bridge into downtown San Francisco will allow motorists an easy drive in and out of the city once again, but the reconstruction of the Transbay Terminal as a regional rail hub has much further reaching implications. The Peninsula Rail System is now publicly owned, and operates trains daily from downtown San Francisco to Gilroy, over 75 miles to the south. With a downtown terminal in San Francisco, and an upgrade of the system as an electrified transit system, using the German S-Bahn as a model, the hundreds of thousands of residents on the Peninsula and the Santa Clara Valley would have access to transit service identical or better than BART's many years sooner, and for billions of dollars less.³

East Bay residents could enjoy similar service under a plan presented by the Modern Transit Society. Soon, a study will be conducted on their plan to reinstate light railways on the corridors once served by the Key System, along with placement of an electric transit system along the Southern Pacific Railway to Pinole.⁴ If a offer by Southern Pacific to operate commuter trains on its tracks from Fairfield and Brentwood to Oakland is included, construction of a hub for a regional rail network in downtown San Francisco would benefit millions of people throughout the Bay Region.⁵

Every transit planner sees that a downtown railway terminal in San Francisco is a necessity, not only for peninsula commuters, but for people from all over the state. A multi-volume report to be used in the planning of a network of high speed railways for the state, recently completed by the Institute of Urban and Regional Development at the University of California at Berkeley, has designated a downtown terminal in San Francisco to be necessary to attract the greatest private investment in development of the railway.⁶

The following project, the Norton Project, takes a fully funded, yet poorly conceived project and combines it with a poorly funded project of statewide importance, and gives the residents of San Francisco and the Bay Area a world-class transportation hub.

The key to this proposal is a belief that any project as big as the reconstruction of the Terminal Separation Structure must be carefully planned to provide the maximum benefit. Caltrans seems to think otherwise. They believe any thought given to the urban or regional implications of the project is not their job. They must simply tend to their wounded freeway. This attitude cannot be allowed to dictate the wasting of many millions of dollars on an outmoded transportation project, with projects of a far greater regional importance dying due to lack of funding.

Emperor Norton Boulevard

In honor of Emperor Joshua Norton, a local character from the 1800's who first called for the construction of a bridge to link Oakland to San Francisco, new ramps would be built from the Embarcadero to the Bay Bridge. These ramps would be built as a city boulevard, not a freeway, although they would be elevated above some of the city streets. By designing the ramps to less than the standard of a freeway, the alignment can be altered to open up valuable parcels of downtown land, now covered by the freeway.

³The German S-Bahn is a standard gauge railway system which allows trains from all over a metropolitan area to utilize existing railways until reaching the center of a city. At this point, new tunnels carry the trains into the downtown areas. This system operates as a rapid transit system, like BART, but extends over a much wider area, because of its compatibility with existing railways.

⁴ACR 107, passed unanimously by the California Assembly on May 13, 1992, would direct the Metropolitan Transportation Commission to study the Modern Transit Society's BAYLINK proposal for new East Bay rail lines.

⁵In June of 1992, the Southern Pacific Railway offered to operate commuter trains along its track from Fairfield and Brentwood into Oakland, if a public subsidiary was available. In early 1993, BART offered to subsidize and operate it.

⁶In defending its preferred alternative for the high speed railway segment into the urban center of the Bay Area, the Calspeed group clearly states, "...a San Francisco CST link is likely to generate more financing interest from the private sector than an East Bay link..."

Emperor Norton Boulevard would be a 4 to 6 lane elevated boulevard from the Bay Bridge to the intersection of Beale and Folsom Streets. From that point, it would continue as a landscaped boulevard with a wide median, replacing Folsom Street from Beale Street to the Embarcadero. This plan maintains the same number of lanes as Caltrans plan, providing almost the same traffic capacity as the Caltrans plan. It is designed to act as a transition between freeway driving and city driving, as San Jose Avenue attempts to do. It is crucial to slow traffic approaching the Embarcadero, so that by the time drivers reach the Ferry Building area, they are driving at a safe speed and not endangering pedestrians.

The design of Emperor Norton Boulevard will serve the same purpose as Caltrans' proposed project, but it considers the shifts in transportation patterns made since the 1950's. Caltrans plan shows a disregard to the changes that San Francisco's transportation system has undergone in the last 40 years. The original Terminal Separation Structure was to be a critical link in the Bay Area's freeway system, connecting travelers from the Bay Bridge to freeways leading to the Golden Gate Bridge and the Peninsula. But today, with all of the freeways planned to connect to the Terminal Separation Structure dropped from the regional freeway system, and the Embarcadero Freeway's replacement likely to be a surface boulevard, it makes little sense to construct the expensive highway which Caltrans proposes. Additionally, Caltrans' plan does not make any attempt to adapt its proposed highway into the city's fabric, or address the very question of its necessity.

This proposal for Emperor Norton Boulevard provides a design that complements the careful attention paid to the Embarcadero Boulevard project. At the intersection where Emperor Norton Boulevard meets the Embarcadero, near the new Rincon Point Park and Gap Headquarters Building, a gateway would be built to welcome travelers into the city.

By selecting to build Emperor Norton Boulevard, San Francisco gains the opportunity to forge a link that not only will carry travelers to and from the Bay Bridge, but also bring life to Rincon Hill's residential neighborhood. It is an opportunity that the city cannot afford to lose.

Peninsula Railway Connection Background

For years, planners have been working to extend the Peninsula Commute System to Downtown San Francisco. In fact, in the early 1900's, Southern Pacific planned to make their headquarters building at the foot of Market Street the terminal for the Peninsula line. Since the early 80's, Caltrans has put forth many plans ranging from running the trains along the old surface tracks on the Embarcadero to Market Street, in a tunnel along the Embarcadero to the Transbay Terminal, and in a tunnel up Second Street to either the Transbay Terminal or Market Street. Almost all of these plans have died, except for the Second and Market Street Terminal. The Second and Market plan is dying due to lack of attention and money. This cannot be allowed to happen.

Current plans for the Peninsula Commute Service have outlined a number of projects that will enable the conversion of the current commute service into a high frequency rapid transit system. All of the planned improvements are simple to implement, except for the extension of the tracks into downtown San Francisco. The service improvements can be carried out without the extension to downtown, but it makes very little sense to have a rapid transit system that doesn't run all the way into the region's number one employment center. Without a commitment to a downtown terminal, funding improvements to the existing service will make little sense. Funds will more likely be awarded to progressive BART extensions further along the peninsula. This scenario would eventually provide the peninsula with a functional rapid transit system, but the final cost will be many times greater than an upgrade of the existing service, and the work would not be completed until far into the next century. Transit planners cannot fool themselves into believing that a downtown terminal for the Peninsula Commute System is not a regional necessity. Imagine if BART's only San Francisco station was at Fourth and Townsend.

Each of the current plans discussed to bring CalTrain to Downtown entail complicated and expensive construction. The leading plan to bring the Peninsula Commute System into downtown San Francisco envisions an underground line from China Basin to Market Street, via King and Second Streets. Due to the length of underground construction, and the need to build a two level underground terminal beneath Second Street, the project is estimated to cost around \$750 million. A second proposed alignment along the Embarcadero to the Transbay Terminal requires the digging of a wide trench along its entire path, and the demolition and clearance of many properties behind the Transbay Terminal.

Although a downtown extension of CalTrain would benefit many more people than an extension of BART to SFO, BART's plans are proceeding rapidly towards actual construction, mainly because BART's administrative structure allows it to lobby for funding and public support. Planning for the PCS is carried out by the Joint Powers Board, comprised of members of local government from each of the three counties that currently fund the system. The system is run as a division of SamTrans, who contracts the operation of the system to Amtrak. Clearly, there is little direct connection between each level of this bureaucracy, leading to a certain lack of vision.

The weakness of this situation is best demonstrated by the problems in the current 9-year plan for the railway. The plan was authored by SamTrans staff, who left out any mention of planned upgrade projects. When the draft report was released to the public, a huge outcry went out over the omission of projects that were included in the previous year's plan. At the following meeting of the Joint Powers Board, the SamTrans staff responsible for the document was instructed to put the projects that were omitted back into the plan. This situation points to the lack of energy behind the operation of the current system, and it gives a clear reason why the downtown extension is languishing.

Project Description

The Emperor Norton Project design accomplishes more than a simple re-connection of the Embarcadero and Downtown areas to the Bay Bridge. The project design takes advantage of the opportunity to carefully plan development in the Transbay Terminal and Rincon Hill areas. While the city has already invested millions of dollars to begin the redevelopment of the Rincon Hill area, the integration of the emerging residential neighborhood on the hill can be finished and tied to the downtown area with the funds provided for the removal and reconstruction of the Terminal Separation Structure. Careful consideration was given to assemble a proposal that would cover the transportation needs of the region far into the future.

This proposal for the extension of the Peninsula Railway into downtown should be able to overcome many of the hurdles placed before others. Its alignment provides for a much less costly above-ground terminal, with a strong opportunity to utilize the sale of "air-rights" above the terminal and approach trackage to pay for much of the local cost of the extension. This removes the biggest obstacle to the project's progress, namely its funding.

This new design, by virtue of the fact that it is part of a total development scheme, should obtain much greater support and interest throughout San Francisco and the Bay Region. Whereas the current plan simply proposes to construct an expensive tunnel and underground terminal, this proposal provides for a new boulevard, railway terminal for travelers from all around the region, and significant development opportunities to connect the emerging Rincon Hill and South Beach areas to Downtown. Its funding comes from a wide variety of sources, traditional and non-traditional. Federal and State funds for the reconstruction of the highway are used, along with contributions from San Mateo and Santa Clara Counties (Over \$200 million is already committed from San Mateo County), private funds, from the sale of surplus land, "air-rights", and joint development of the rebuilt Transbay Terminal. San Francisco's contribution would be partial funding of the reconstruction of the Transbay Terminal, and the crucial planning and zoning allowances that the project would require. These allowances include special consideration to developers of the buildings built as part of the project. In a city as thoughtfully regulated as San Francisco, planning exemptions are worth many millions of dollars to builders and developers.

As an example, a private developer offered to pay the full cost of building a tunnel for the Embarcadero in front of the Ferry Building in return for the right to build an office building on another city block freed by demolition of the freeway. The value of this offer was \$125 million. About four times as much land would be available to developers in this project, not counting possible "air-rights" sites or the Terminal itself.

These sources of funding remove the project's biggest obstacle. Combine this with the fact that the new alignment and above ground terminal would be less costly than the current plan, the connection of the Peninsula Railway to Downtown San Francisco, and its conversion to a electrified rapid transit system has the ability to coalesce into a completed project before the end of this century, years before BART can even make it to the airport.⁷

Alignment

The current right of way for the Peninsula Commute System enters San Francisco along Seventh Street, beneath the 280 freeway, in the China Basin area. With the development of Mission Bay, the MUNI is planning to construct a storage and maintenance facility next to the PCS right of way in the area, as an extension of the MUNI line that is going to run along King Street. With the blocks where the current PCS terminal is located planned to be developed into office buildings, CalTrain will need to be relocated into a "cut and cover" tunnel beneath the blocks bounded by Sixth, Townsend, Third, and King Streets. While some people are calling for the trains to remain on the surface through the Mission Bay Development until Fourth Street, this seems to be an unrealistic goal.

Near Third and King Streets, the alignment begins a gentle curve towards downtown, with the construction method switching from cut and cover tunneling to bored tunneling. The bored tunnel extends from Third Street to just south of Folsom Street, behind the Marathon Plaza building. By boring the tunnel through this densely developed area, construction impacts are all but eliminated.

From the north portal of the bored tunnel, the railway continues underground in a short cut and cover tunnel, passing beneath Folsom Street. After Folsom Street, the railway makes the transition to the elevated structure that carries it over Howard Street, on the same alignment as the existing bus ramp.

The tracks follow the existing alignment into the rebuilt Transbay Terminal, with the rail platforms replacing the current bus platforms. The removal of the buses from the terminal is possible by building a second deck, as proposed in a mid-70's by Skidmore Owings & Merrill's plan to rebuild the terminal.⁸ The new second level of the terminal accommodates the new East Bay rail lines, with the existing Greyhound and GrayLine busses relocated to a new terminal at street level in the East Unit of the building. Golden Gate Transit busses stop at new platforms built at street level in the Center Unit of the new building.

After passing through the terminal, the tracks would run beneath the upper deck loop as far as First Street. This lower deck on the loop would provide both a storage and light maintenance area for midday storage of some trains, and a ramp to the upper level allowing a rail connection between the East Bay and

⁷The Calspeed report envisions that a high speed rail line on the peninsula would include a stop at SFO. If a shuttle was instituted between a downtown rail terminal and the airport, passengers could enjoy a non-stop 15 minute trip to the airport. In comparison, a trip on the planned BART line between the Montgomery Street Station and SFO would take more than 30 minutes and include 9 stops.

⁸While the SOM study did not look at adding rail to the Transbay Terminal, it did study various configurations to add a second deck to the terminal, for additional bus service.

Peninsula trains. This plan allows trains to continue to pass out of the terminal area after discharging their load of passengers. This arrangement, known as a tail track, permits a much greater efficiency in train operations, since trains do not have to immediately re-enter main line service.

With fast electric trains running between Downtown San Francisco and Gilroy, the residents of the South and West Bay will have a transit system as good as part, but at only a fraction of the cost. But this vision of a true transit system is only possible with a terminal in San Francisco that is located downtown, with convenient connection to BART and MUNI.

Bay Bridge Railway Connections Background

In the 1920's, when the Bay Bridge was designed, electric railways carried millions of commuters from all over the East Bay to ferries that carried the travelers into San Francisco.⁹ The planners of the bridge knew it was a necessity to provide a railway across the bay, to allow commuters a smooth ride all the way into downtown San Francisco.

From the opening of the bridge to the late 1950's, two sets of rails were carried on the lower deck, along with three highway lanes for bi-directional truck and bus traffic. Once in San Francisco, both the highway lanes and the rails left the lower deck in the area which is now the Essex Street on ramp. It wasn't until after the removal of the rails from the lower deck of the bridge that the lower deck highway lanes were extended to connect to the Skyway and 101 freeway.

The changes made to the bridge and its ramps when the rails were removed eradicated the simple connection that the railway once had between the bridge and the Transbay Terminal. While the busses that currently use the terminal may travel in the same lanes as automobiles, any new rail system cannot. Additionally, today's bridge traffic cannot be adapted to the original patterns that the bridge was designed to carry.

The reintroduction of a railway to the Bay Bridge requires that each deck be reconfigured to allow for four highway lanes and one train track. Also, because the proposed railway across the bridge and into the Transbay Terminal will not be compatible with automobile traffic, dedicated ramps will be required to carry the railway from the bridge to the terminal, grade separated from highway traffic.

The design and alignment of Emperor Norton Boulevard provides space for a relatively simple connection between the terminal and the bridge. The design of the connection to the Peninsula Railway accommodates both the construction of the trackage for the Bridge Railway, and the construction of trackage linking the trains of the two railways. This arrangement allows trains to enter San Francisco along the peninsula and then continue out of the city across the Bay Bridge. Express service from throughout the region to the San Francisco Airport is only one of the possibilities that rail service across the Bay Bridge can provide.

Project Description

While not as crucial to the project as the Peninsula Railway connections, this plan takes into consideration the proposal to re-introduce rail service to the Bay Bridge. The alignment and structure proposed in this report can easily accommodate either rail vehicles, or busses. For the purposes of this report, the assumption is made that the East Bay rail system will be built by the time of the Terminal reconstruction. If for some reason the rail plan is delayed, the rail ramps from the Bay Bridge could be built without rails, or the rails could be installed, and then temporarily paved over for busses.

As mentioned earlier in this report, Caltrans' plans for the reconstruction of the Terminal Separation are virtually identical to the quake damaged structure that it replaces. At the meeting that Caltrans held to discuss the demolition phase of the project, the engineers on hand admitted that they gave no thought to accommodating any proposed rail system that might be reintroduced to the Bay Bridge. This omission, if allowed to stand, makes the addition of separate rail connections between the Transbay Terminal and the bridge a much more costly and complicated project.

Currently, there are no set plans for the best location on the bridge for the new railway. This plan proposes that the new railway be constructed on the south lane of each bridge deck. It seems that the current highway ramp configuration on Yerba Buena Island will be easier to adapt to allow rail operations on the south side of the bridge. Additionally, bringing the rails to the south side of the bridge, above the highway on the general alignment of the former ramp from the Terminal Separation, avoids many of the conflicts that a lower ramp from the north side of the bridge might encounter.

Alignment

The new loop structure proposed to carry the Bridge Railway between the Bay Bridge and the Transbay Terminal follows generally the same alignment as the existing bus loop. Two variations occur between the alignment of the new ramp, and the alignment of the existing bus ramp. The first variation moves the new ramp as close as possible to the new highway ramps, clearing the maximum acreage of land for development. The second change allows the railway to pass over the existing approach to the bridge.

⁹The initial planning of the Bay Bridge assumed rail transit would be carrying 35-40 million passengers per year. While later studies revised this figure, the original Bridge Railway, including the Transbay Terminal, accommodated 500,000 passengers per day.

The westbound railway leaves the existing lane 1 (furthest south lane) of the bridge just west of the San Francisco Anchorage. It travels along generally the same alignment of the former BR line of the Terminal Separation Structure. The eastbound railway makes its transition to the lower deck in this same area. As the highway approach leaving the bridge slopes down, the single track westbound railway meets with the single track eastbound railway to turn to the northwest and pass over the highway. After crossing the highway, a set of switches allows a third track to be added along the ramp.

Halfway between Harrison and Folsom Streets, the railway passes above the ramp connecting Emperor Norton Boulevard to the Skyway. At this point, another set of switches split the railway for the terminal loop, with three tracks turning to parallel Folsom Street, and three tracks coming from the ramp which runs parallel to Second Street.

On the Folsom Street ramp, the railway is traveling on the upper deck of a two level structure. The top deck has two tracks for midday storage of equipment and one through track into the terminal. The lower deck accommodates the three tracks which make up the midday storage facility for the Peninsula Railway. This arrangement remains until Beale Street, where the railway begins its turn back into the Transbay Terminal.

Through this long curve, one track descends to the lower deck. As the tracks pass above Beale Street and into the upper level of the Terminal, the tracks split again, providing six tracks serving three boarding platforms. As the tracks leave the terminal, a series of switches merge the six tracks back to three for the run up the ramp to the bridge. On this ramp, one track returns trains to the bridge, while the other two serve as storage space to hold extra trains during the day.

If for any reason, the East Bay Railway is not built immediately, this portion of the project would still be built as ramps for Transbay busses. The only change would be an extension of the ramp between the levels all the way down to street level, to provide a way for maintenance vehicles to enter the bus ramp. All other bus platforms would still need to be relocated to street level, since the location and length of the ramp from street level would not be adequate for heavy traffic. Also, special attention in the form of lane striping and signage would be needed at the point the bus ramps leave the bridge, to keep motorists from mistakenly using the bus ramp.

Transbay Terminal Reconstruction Background

Since 1967, state and local agencies have been examining proposals for the renovation and reconstruction of the Transbay Terminal. In 1978, The San Francisco Bay Area Transportation Terminal Authority (SFBATTA) proposed a number of alternative actions which could be employed to expand the Transbay Terminal.¹⁰ These alternatives ranged from "no-build" to the complete demolition and reconstruction of a two level terminal, office building, and park. The Transbay Terminal, as it exists today, roughly represents the implementation of Strategy 1, the lowest cost upgrade proposed.

In 1983, Caltrans presented a proposal to build an underground rail terminal next to the Transbay Terminal, along Howard Street. This plan called for four high rises to be built above the new rail terminal, to help off-set the cost of the improvements. This plan still exists to some extent, although a privately funded high rise is approved to be constructed at the corner of Howard and Beale Street, covering the eastern portion of the site.

The Transbay Terminal, as it exists today, remains mostly as it was when it opened in 1939. The passenger spaces have been partially remodeled over the years, but the terminal has few of the features that a major transportation center needs. In addition, the public spaces are poorly utilized, and have been allowed to slowly deteriorate. Most public agencies recognize the need to improve the terminal, but regional funding priorities have kept improvements to the terminal to a minimum. Recent improvements have been limited to the installation of new signage and the remodeling of the headhouse and one of the bus lanes to accommodate Greyhound busses.

With the improvement and expansion of rail service into San Francisco from both the East Bay and Peninsula, AC Transit will be able to abandon all of its lines into the terminal, leaving the Gray Line tour busses, Amtrak shuttle busses, Greyhound and Golden Gate Transit as the only transportation lines in the terminal. Gray Line busses use the terminal during non-rush hours as a central pick-up stop for tourists, and can be easily accommodated at a new street level berth. Most Amtrak busses would become obsolete when rail service begins across the bridge, the busses, if any remained, would continue to stop at street level. Golden Gate Transit only occupies a small portion of one bus lane at the west end of the terminal, their operations can be easily relocated to a street level berth. Only Greyhound, whose operation requires specialized passenger and baggage facilities, will require a dedicated terminal space, which can easily be provided in a new space at street level in the East Unit of the new building.

Project Description

With the extension of two major transportation systems to the Transbay Terminal bringing many times the number of passengers to the terminal that come today by bus, it becomes necessary to propose that the existing terminal be completely reconstructed. The construction and design of the existing structure

¹⁰U.S. Department of Transportation - Urban Mass Transportation Administration 1979 *Draft Environmental Impact Statement- San Francisco Bay Area Transportation Terminal Expansion*

provides very little tolerance for major alterations. The public areas function poorly for the travelers they accommodate today, the conversion to a major terminal would render them almost useless.

To accommodate the new rail commuters, and the remaining bus patrons (including MUNI) and the eventual high speed rail passengers, the existing terminal must be removed and replaced by a new building. This proposal for a new building is loosely based on the building outlined in Strategy 4 of the SFBATTA study, outlined above. This plan called for the replacement of the existing terminal by a new two level bus terminal, with the MUNI berths moved beneath the new building, making space for a park in front of the terminal.

This current proposal recommends a new terminal to be built along the same lines of the one proposed in 1979. MUNI and Golden Gate Transit loading areas would be moved under the center unit of the terminal, with escalators and elevators connecting the platforms to the concourse area above. A new Greyhound terminal would be constructed beneath the east unit of the terminal, with elevators and escalators connecting the platforms to the baggage and ticketing areas one level up, off of the main concourse.

The front of the terminal, now free of the MUNI ramp, would be converted to a park, which would serve as the entrance to the terminal. The land and walkways from Mission Street would slope up through the park to the concourse level of the terminal. All pedestrian traffic on the central block of the terminal would come up into the concourse, to avoid conflicts with the MUNI busses turning into the berths at the street level of the terminal. On the south side of the terminal, future development would be required to provide a place for walkways to connect pedestrians with the street level again. Until future development takes place, a pair of ramps on the south side of the terminal would provide access to the street.

The new terminal concourse would pass above First, Fremont and Beale Streets. Travelers would have access to all transportation services from the concourse. Moving ramps would connect down to the Natoma Street Transit Mall, for shuttle busses and taxis. Escalators and elevators would connect to the rail platforms above, and the MUNI platforms below. Greyhound would operate its passenger facilities on the east end of the concourse, future high speed railway passenger services would be accommodated at the west end of the concourse. From the concourse, people would also have access to the building built over the east unit, the hotel over the west unit, and any building developed on adjacent parcels.

Throughout the concourse, escalators and elevators would carry passengers to the rail platform levels. As stated earlier in the report, the upper level platforms would serve trains coming from the East Bay. The lower level platforms would serve trains from the peninsula. High speed inter city trains would be accommodated with a separate platform on the first level.

Across the top of the terminal of the building, people could enjoy sun filled plazas overlooking downtown San Francisco. Off of these roof plaza, restaurants would be located in the two buildings built over the other parts of the terminal.

The widening of the eastern sidewalk of Beale Street, between Mission and Market Streets would enhance connections to Market Street. Escalators and ramps would connect the east end of the concourse with a tunnel under Mission Street at Beale Street. After passing under Mission Street, pedestrians would come up to the widened sidewalk for the one-block walk to the Embarcadero BART/MUNI station. If funding could be found, the tunnel along Beale Street could be continued all the way to the station, with moving sidewalks carrying travelers between the terminal and BART/MUNI. Another possibility exists for P.G.&E., owner of the properties along Beale Street, to provide a continuous concourse through the basement level of its buildings between Mission and Market Streets.

The development above the terminal would complement its operation. Most of the world's major terminals have a hotel for travellers included in their development. For this reason, a hotel is proposed for development above the west unit of the new terminal. The hotel's motor entrance would be along Minna Street, but its lobby would be located above the top rail level. Escalators and elevators would connect the lobby to both the terminal concourse and street level.

The hotel development would serve both travelers arriving in San Francisco by train, and conventioners, since the site is located only 1-1/2 blocks from Moscone Center. If a Downtown Arena were to be built adjacent to the Transbay Terminal, even larger crowds could be expected for the hotel, staying in the city for the night after an event at the arena.

The office building above the Eastern portion of the terminal would complement the other buildings in the area. It could hold the administrative center for a regional railway authority, and include residential space on its upper floors and retail at its base.

Carefully designed as a unified development, and even if it is built in a series of stages, a new terminal development in Downtown San Francisco provides the focus for an area planned to accommodate the last new highrises in the city.¹¹ By providing rail connections to all area of the region and state, the impacts of future development in the area will be minimized.

Project Funding

Money stands as the major obstacle to construction of a downtown rail terminal. While San Mateo county has committed over \$200 million towards the project, and the Federal Government can be expected to

¹¹ The Downtown Plan for San Francisco has designated the blocks surrounding the Transbay Terminal as the area for almost all of the future highrise development in the city. Some blocks in the area have height limits of up to 600 feet.

contribute a quarter of the final cost, there are many obstacles to closing the gap in the funding. Without an assurance of funding, the project has stalled.

The design of the Norton Project provides for the utilization of many sources to fund construction. With the current proposal for a underground terminal at Second and Market, many millions will be spent to construct a huge underground terminal, but there is no opportunity to take advantage of any type of joint development arrangement.

Likewise, little is gained by an underground terminal adjacent to the Transbay Terminal. An underground rail terminal south of the current Transbay Terminal requires the acquisition of many properties planned for highrise development. The purchase of valuable downtown real estate, zoned for high-rise development, and the excavation and construction of an underground terminal is easily too big a project to have its construction costs offset by the development of air rights.

Additionally, the opposition to a lengthy period of extensive excavation in downtown San Francisco required for either of the underground terminal proposals could cripple support for the project. Many examples of business disruptions due to transportation project could be used to argue against the construction of an underground terminal at Second and Market Streets. Opponents could use the example of the BART/MUNI subway construction along Market Street, or the construction of San Jose's downtown transit mall.

Current proposals for construction of a downtown terminal use the economics associated with the two projects outlined above, relying on a huge infusion of public money to fund the project. This reliance on scarce public money has lead many people to conclude that some other type of project must accomplish the goal of bringing peninsula residents to downtown San Francisco. Proposals along this line range from converting the existing peninsula system to a light rail operation, to simply improving the MUNI service to a new rail terminal even further from downtown, somewhere along Seventh Street.

While these proposals provide a suitable substitution for the current service, they can not easily accommodate an upgrade to a full rapid transit service. Imagine if all BART passengers were forced to transfer to the MUNI to complete their journeys to downtown San Francisco. These proposals also ignore the fact that California will someday have a high speed railway network. Do people really believe that the future terminal for a high speed train to LA should be located under the 280 freeway?

We cannot allow the strong reliance on public funding to force us to settle for a second rate solution for creating a suitable connection between the two major rail systems in the Bay Area. This proposal was written to prove that a first-class project can be funded and built to connect all rail services serving San Francisco. And it can be built with available funds.

Taken as a whole, the Emperor Norton Project actually adds property to downtown San Francisco. This single fact is a sign that a public/private partnership in some form will bring the construction of a Regional Rail Terminal in downtown San Francisco to fruition.

Surplus Property Development

When the city was arguing over the removal of the Embarcadero Freeway, I.M.Pei and Partners offered to remove the freeway and build a underground tunnel to replace it, in exchange for the rights to develop a highrise on property once covered by freeway ramps. While the offer was not accepted, the city placed its value at over \$125 million. We cannot assume that the land on Rincon Hill is as valuable as the land adjacent to the Embarcadero Center, but there is a much greater opportunity to use surplus property sales to supply the funding for this project.

1. The offer associated with the Embarcadero Freeway was for a parcel of approximately 90,000 sq.ft. Using the highway alignment in this proposal, over 270,00 sq.ft property will be available for development. This does NOT include any portion of the 165,000 sq.ft terminal site.
2. The plan for the Embarcadero site took over a portion of an existing park. All of the property in this proposal is currently utilized by surface parking lots, all covered by freeway ramps. Little opposition should arise over the loss of parking lots.
3. A 30 story building was proposed for the Embarcadero site. The blocks around the Transbay Terminal are zoned for much taller buildings, and in fact, this area is the last place in San Francisco zoned to accommodate buildings over 40 stories.
4. The Rincon Hill area is currently undergoing a conversion from commercial to residential uses. Developments could be planned to help create a transition between the commercial areas downtown, and the emerging residential area of Rincon Hill.

In addition to the property created by the removal and reconstruction of the freeway, the reconstruction and expansion of the Transbay Terminal can be planned to accommodate the development of its air rights. It would not be foolish to propose the construction of a hotel above the western portion of the terminal, and an office building on the eastern portion. Development above the central portion of the terminal would not likely be possible, since any building would seriously shade the proposed public park along Mission Street in front of the terminal. Instead, a park should be built on top of the center portion of the terminal, using the structure and its circulation patterns to allow a public space to flow through the building from the street level to the roof.

Public Funding Sources

The opportunities for private participation in the project outlined above will not pay for the entire project, but they will lower the cost to the point where the remainder of the project can easily secure public funding from many sources. These sources include:

1. Committed funding from San Mateo County¹²
2. Pledged funding from an extension of Santa Clara County's Measure A tax¹³
3. Funding from San Francisco's Transit tax¹⁴
4. Enhanced Federal participation above the current 25% level
5. Caltrans funding for the Terminal Separation project¹⁵
6. Caltrans funding for Transbay Terminal seismic upgrading¹⁶
7. State transit funds (Proposition 116)

Additional public funding could come from these sources:

8. Alameda and Contra Costa County transit tax money¹⁷
9. State High Speed Rail Funds¹⁸
10. BART¹⁹

Conclusion

This proposal was prepared to show that there exists another option for constructing a downtown rail terminal, an option that is simpler to build and easier to fund than the existing proposal for a underground terminal.

Numerous proposals have been presented for the extension of Peninsula rail service to Downtown San Francisco. As the years have passed, many of these proposals have become infeasible. But as many opportunities have passed, the pending removal and reconstruction of the Terminal Separation has provided the best chance to get a downtown extension constructed. With the demolition of the structure expected to last until Fall of 1993, time remains to question the validity of Caltrans' current plans for a replacement structure.

Almost every person and organization in the region supports a better connection between the transit systems of San Francisco, the East Bay, and the Peninsula. Their views on how this connection should take place differ, but most all realize that the historic rail corridor on the peninsula, and not BART, is the key to effectively providing rapid rail transit to the millions of residents of the Peninsula and Santa Clara Valley. The corridor has been recognized as the future route of a proposed high speed railway, linking Los Angeles and the Bay Area. Every effort must be made to secure and improve service along this corridor and into a Downtown San Francisco Terminal.²⁰

Now is the last chance that will likely exist to bring trains from the peninsula into Downtown San Francisco. If today's proposals die with all of the previous plans, no railway will ever reach downtown San Francisco. Travelers arriving on high speed trains from Los Angeles and Sacramento will have to transfer to BART in West Oakland to complete their journeys to the city. The residents of the Peninsula will have to wait until well into the 21st century to have a transit system that brings them to Downtown, and that system, BART, will end up costing billions of regional dollars to construct.

¹²As of 1992, San Mateo County has over \$200,000,000 committed towards extending CalTrain to Downtown San Francisco.

¹³In November 1992, voters in Santa Clara County extended their transit tax, which is to be allocated almost entirely to rail transit construction.

¹⁴Politically, San Francisco's money would probably be limited to the reconstruction of the terminal, since it would benefit the MUNI system.

¹⁵Caltrans has \$100,000,000 to carry out their current plans to rebuild the Terminal Separation. Since this proposal for the reconstruction of the ramps is much simpler, the funds could pay for additional transportation projects.

¹⁶Caltrans plans to spend \$30-50 million on seismic upgrading and maintenance of the Transbay Terminal.

¹⁷The BAYLINK proposal, since it serves the East Bay, is eligible for sales tax money from those counties.

¹⁸The Calspeed report includes a \$400,000,000 funding commitment for a Downtown San Francisco Terminal.

¹⁹San Francisco is eligible for BART money for local transportation projects. In addition, it is possible that a consolidation of regional transportation agencies would have BART take over operation and improvement of the peninsula railway.

²⁰The Calspeed project says of the existing railway on the peninsula, "the top priority is to safeguard the existing right-of-way against any future encroachments..."

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Appendix 1 - Impacts and Mitigations for the PCS Downtown Extension Emperor Norton Proposal

1. The increased rail traffic at 16th Street Crossing will result in greater delays to motorists.

16th Street grade separation is not funded by this project. There is no need to mitigate this impact, since it would exist even if the terminal was not relocated. Grade separation of any existing rail/highway crossing should be a street improvement, not a rail improvement.

2. The combination of the 6th and Owens MUNI Metro stop with the proposed MUNI Metro stop immediately south of China Basin into one stop on China Basin Trestle impacts the planned MUNI service in the area

The construction of a consolidated MUNI Metro stop on the China Basin trestle will be able to serve travelers on each side of the channel well. Since a new MUNI stop on a trestle spanning China Basin can be constructed beneath the area once completely spanned by the I-280 freeway, there would be no net impact on the "fill" of China Basin, by the Bay Conservation Development Commission's definition. Additionally, due to the original alignment of the 6th, King, Berry and Owens intersection, moving the stop 200 feet to the south and linking it to the promenade along China Basin improves access to the proposed ballpark site and Showplace Square area.

A stop built on a trestle across China Basin would also serve as the focus of a redesigned park for the shores of China Basin west of Owens Street. (See # 3) Proposed pedestrian undercrossings on each side of the channel would provide unimpeded access from both the west and east sides of Owens Street.

3. Rail crossing of China Basin cuts off access to pedestrians along China Basin.

San Francisco's Department of City Planning calls for a promenade along both sides of China Basin Channel, each terminating in a park at the western end of the channel, next to the Division Street Pumping Station. (see SFDCP: *Mission Bay Plan, Recreation and Open Space Design Guidelines - China Basin Channel Frontage*) To facilitate the unimpeded flow of pedestrians and bicyclists across the railway R.O.W., MUNI R.O.W., and Owens Street, the promenade will be depressed to water level beneath each of the three trestles over the channel. Additionally, the realignment of the railway into the same area as the MUNI extension and Owens Street improves access to China Basin and Mission Bay from Lower Potero Hill and Showplace Square by removing the railway tracks from the edge of Seventh Street.

The present proposals for the extension of the railway to downtown place the transition segment of the railway directly adjacent to Seventh Street, creating a physical separation between the Showplace Square neighborhood and the China Basin Channel. By moving all of the transportation corridors beneath the freeway, and aligning them with the freeway's structure, the manmade environment in the area is visually cohesive, and less intrusive upon the park areas.

Finally, the entire area between Owens Street and Seventh Street holds the opportunity for the development of a park that works with all of the transportation infrastructure that passes across it. As part of Mission Bay's development, a competition could be held to provide a design for the park and its structures that maximize the opportunities to watch trains pass, listen to the water passing in the sewers, and welcome people into Mission Bay.

4. The Railway's Transition to Subway is disruptive to proposed street pattern beneath the Freeway

To permit a smooth transition in both the vertical and horizontal planes, the transition between a surface railway and an underground railway forces the redesign of the Owens/Berry/Sixth/King streets intersection, along with the MUNI extension alignment. The reasons for the placement of the transition in this alignment are as follows:

1. The design specifications that guide the alignment of the extension generate a minimum distance for the vertical transition. To keep within the maximum grade of 4% (4 feet vertical change per 100 horizontal feet), and to maintain proper vertical clearances for the railway equipment (21'6" minimum clearance), the minimum horizontal distance for the transition zone is 625 feet. (25 feet vertical change @ 4% = 625 feet).

2. To maintain compliance with San Francisco Master Plan requirements, the railway should not be above ground past I-280/Sixth Street. Additionally, the distance that the train is underground should be minimized. To meet these requirements, the transition ideally should occur in the area between the China Basin Channel and Sixth Street.

3. The Berry Street sewer and the Division Street outfall each lie beneath the R.O.W. of the existing, and any proposed extension. While the reconstruction of the Berry Street sewer to avoid the railway's transition area will be expensive, the cost must be viewed relative to the benefits of depressing any proposed ballpark or arena at Seventh and Townsend Streets. Thus, higher priority is given in this plan to avoiding the Seventh and Townsend Site than is given to avoid conflicts with the Berry Street sewer.

4. The projects that will be affected by the placement of the transition are still not constructed. (I-280 Touchdown Ramps, MUNI extension to 16th Street, Owens/Berry/Sixth/King Intersection)

To mitigate against conflicts with the projects now in the design and engineering phase, the designers must be made aware of the implications of the inclusion of the railway's transition requirements. The plan presented with this document proposes a solution for redesigning the Owens/Berry/Sixth/King streets intersection that allows the streets to remain within 3 feet of grade where they pass above the beginning of the railway's underground alignment. Other designs exist that could permit a suitable transition, but they all require additional expensive changes to the design of the I-280 Touchdown project.

The most crucial design change is the coordination of the I-280 Touchdown project with the transition placement. Design of the southbound ramp structure to 280 must be carefully integrated with the transition alignment.

5. Shifting the Alignment from King Street R.O.W. to the north will cause significant operational constraints during the construction period to the current CalTrain terminal at Fourth and Townsend Streets .

All available studies on the downtown extension state that a six track terminal is able to accommodate at least a 114 train schedule. During the construction of the cut and cover section of the railway between Sixth and Fourth Streets, tracks 10 - 12 will need to be removed, along with all other trackage and equipment within 100 - 120 feet of the King Street R.O.W.

While current operational practices will need to be modified to work with a 9 track terminal, with possible rescheduling of some trains, riders and operators should be able to easily adapt to the reconfigured services. Currently, much excess service track capacity exists that could easily handle relocated service and storage needs, especially in the west end of the yard.

6. Shifting the Alignment from King Street R.O.W. to the north removes capacity from proposed underground parking garages in Mission Bay blocks 1, 2, & 3.

The decision to shift the alignment from beneath the R.O.W. of King Street to beneath the southern portion of Mission Bay blocks 1, 2, & 3 was made to minimize the construction disruption to King Street, reduce the cost, and allow for multiple station exits into the proposed pedestrian network of Mission Bay.

King Street, along with the MUNI extension and the I-280 Touchdown Ramps, will all be in service/operation before construction starts on the downtown railway extension. This was not the case when the extension was first planned. When motorists once again have I-280 access into downtown San Francisco, and the MUNI begins operations along the Embarcadero, King Street will become a major transportation artery.

Securing an easement for the railway portion between Sixth and Third Streets will place specific constraints on the design of underground parking, but not limit the capacity, for the blocks through which it passes. Since the roof of the tunnel structure will sit an average of 8 feet below the surface for each of the three blocks, the first level of underground parking will not be affected. The area available for each level of parking below the first level will be reduced by an average of 30% across the remainder of the three blocks.

There are many ways to mitigate for this loss of parking in the area, but only a few, specifically below grade options, are applicable. The best plan is to augment the remaining underground spaces by building extra underground parking.

With the necessity of excavating the R.O.W. of the cut and cover tunnel through the Mission Bay area to an average depth of 36 feet below the surface, the opportunity exists to coordinate the excavation of the railway and the excavation of portions of the parking garages.

7. Shifting the Alignment from King Street R.O.W. to the north requires an underground easement across Mission Bay blocks 1, 2, & 3.

The decision to shift the alignment from beneath the R.O.W. of King Street to beneath the southern portion of Mission Bay blocks 1, 2, & 3 was made to minimize the construction disruption to King Street, reduce the cost, and allow for multiple station exits into the proposed pedestrian network of Mission Bay.

If the downtown extension does not proceed in a timely fashion, the Joint Powers Board will continue to hold an easement for the surface of all of Mission Bay blocks 1 & 2. Obviously, the development potential of these two blocks will be severely limited. By agreeing to an equitable swap of easements, the entire surface of blocks 1 & 2 for an underground easement across all three blocks, the JPB will gain a more economical path towards downtown, and Catellus will be free to develop blocks 1 & 2 in a timely manner.

8. Building an elevated viaduct and terminal in downtown will adversely impact the neighborhood through which it passes.

While it is true an elevated alignment and terminal is more intrusive than an sub-surface alignment, modern construction techniques allow a structure to be engineered to easily accommodate a variety of development schemes that will reduce its negative impacts on the area.

The design of the viaduct structure proposed to carry the railway from the Rincon Hill tunnel, through the Downtown Terminal, and through the mid-day cleaning and storage facility, and the new viaduct loop from the Bay Bridge to the Terminal, is based on current engineering technology. Contrasted with the current 1930's terminal loop, and the 1950's Terminal Separator Freeway, the proposed viaduct will be light and graceful. Additionally, wide spans between each pier and an average vertical clearance of 25 feet between the ground and the viaduct provides ample space to allow new development to completely wrap the viaduct. Many of the negative impacts associated with viaduct structures come from associations with older designs, where engineering technology dictated bulky and squat structures. As an example, compare the highway interchange at the east end of the Bay Bridge, built in the 30's and 50's, with the I-280 / 92 interchange, built in the mid-70's, or the ramps which carry traffic into San Francisco Airport, built in the 80's. Obviously, contemporary engineering technology is capable of producing elegant structures that mitigate many of the impacts associated with an elevated alignment.

9. Construction of the new Downtown Terminal, a new lower level viaduct for Peninsula trains and a new upper level viaduct for East Bay services will adversely impact the operation of the current transit service at the Transbay Terminal.

In order to provide a "world class" terminal structure to serve as San Francisco's main railway terminal, the present Transbay Terminal must be removed and replaced with a modern structure. Additionally, to facilitate joint development opportunities on the properties surrounding the viaduct approaches to the terminal, the current bus loop must also be replaced.

In order to mitigate the impacts that removal and reconstruction of the present terminal and ramps will have on existing transit services, the new upper level ramp from the Bay Bridge will be constructed before demolition of the existing ramps. Coordinating the construction of the new bridge loop to minimize impacts on lower level loop operations will be simple due to the design and alignment of the new ramps.

1. Following CalTrans' proposed design for new double level highways, the upper deck of the new bridge loop will straddle the lower deck. Construction will be able to proceed on the new upper deck while the lower level is still in operation.
2. The alignment of the new viaduct differs in many places from the alignment of the present structure. In these areas, specifically parallel to Folsom Street, the construction of the new structure will not interfere with the operation of the existing structure.
3. The connection to the Bay Bridge is made in an entirely different location than the existing ramps. The new ramps will connect to the south side of the bridge immediately west of the anchorage. The existing ramps use the north side of the bridge.

Impacts to the operation of the existing Transbay Terminal will be more difficult to mitigate, but again the design of the new terminal attempts to minimize the construction disruption. The construction program, requiring the demolition of the existing structure and construction of a new terminal in its location, will necessitate the temporary relocation of some of the building's tenants and services. Relocation of each carrier now using the terminal will be coordinated with the goal of making every temporary relocation compatible with the final relocation.

Proposed relocations:

Operator (followed by percentage of terminal use)

1. A C Transit - 47% of daily service - (or any future Transbay rail service) will be the sole tenant of the upper level of the terminal. During each stage of the reconstruction of the terminal, some A C loading areas will be moved to a portion of Lane 1, with appropriate measures to separate A C riders from Greyhound riders.
2. Golden Gate Transit - 6% - will be relocated into the Center Unit of the new terminal at street level. During the first stage of reconstruction, GGT busses now utilizing Lane 3 will be temporarily relocated to the bus stop on First Street, beneath TBT Building 4.
3. SamTrans - 5% - currently using the crescent in front of Building 3, will mostly be phased out, due to the fact that many of the lines that terminate at the Transbay Terminal replicate CalTrain service. The busses that do remain can easily be accommodated in a new curbside bus stop, shared with MUNI's Mission Street lines.
4. MUNI - 21% - will retain their current facilities until the entire building reconstruction is complete. At that time, all MUNI services currently using the ramp at the front of the terminal will be relocated into three dedicated lanes at street level in the Center Unit of the new building. The new MUNI facility will be designed to handle a large increase in boardings, suspected to result when the peninsula rail service extension begins operation.
5. Amtrak - 4% - currently utilizes a loading zone on Natoma Street. Most of Amtrak's service to the terminal operates as only a link to the regional terminal in Oakland. Until rail service is provided on the Bay Bridge, Amtrak busses can operate from a portion of the upper deck. If any provision for Amtrak busses is necessary after intercity rail service begins, Amtrak busses may be accommodated in the Greyhound facility.
6. Greyhound - 10% - will be moved to a new facility at street level of the East Unit when the first two phases of the reconstruction have been completed. It is the goal of the project's design to be able to move all of Greyhound's facilities at one time.

7. Gray Line Tours - 7% - uses a portion of lane 3 as the terminal for their tour bus routes. It is proposed that all of their services be moved into a new facility at street level in the East Unit. Gray Line will be moved into the new facility after the first stage of reconstruction is complete. During stage one construction, Gray Line will be temporarily relocated to a street loading area on the east side of Fremont Street.

8. Other - 1% - Depending on the service, the new boarding location would be accommodated in either the Greyhound/Gray Line facility, or at a street loading area.

It will be necessary to remove most all commercial tenants from the current building prior to the beginning of the reconstruction, and it is not anticipated that it will be necessary to temporarily relocate their operations. It is proposed that the private management of the new terminal be responsible for the negotiation of all leases in the new terminal.

Appendix 2 - Cost Estimations

Although the intention of this proposal is to present a basis for further study and analysis, cost estimations have been included to allow a comparison of the expense of this proposal to previous proposals. The figures used in the cost estimations come from two main sources. One is the extensive cost estimations conducted for each of the alternatives evaluated in the Peninsula Commute Service San Francisco Downtown Station Relocation - Capital Cost Estimating Methodology and Results report of December 1989 by Morrison Knudsen Engineers. This report provided the bulk of the information needed to compile an accurate construction cost for the project. The few unique construction features not covered by MKE were estimated using cost information from the University of California's Institute of Urban and Regional Development's Calspeed Study - June 1992.

Rolling stock acquisitions are not included in this proposal, because it is assumed that the entire CalTrain system will be electrified through a separate project. Previous extension proposals called for the acquisition of complex and expensive bi-modal (electric/diesel electric) locomotives, ignoring the possibility that electrification would take place on the remainder of the line. The current electrification feasibility study (Caltrans / Morrison Knudsen, October 1992) has indicated that electrification of the the entire line should be a top priority if service is to be expanded past the 66 train level. Since electrification of the line would require the acquisition of new electric locomotives or Electric Multiple Unit trainsets, and the downtown extension can be operated without any additional equipment, no rolling stock costs are assumed for this extension proposal.

The construction of the Downtown Terminal is difficult to estimate without a specific design. The costs in this report include the costs to construct the railway through the terminal building, the demolition of the existing Transbay Terminal and construction of the shell of the new terminal (including escalators and elevators) and relocated bus facilities. This amount does not include the construction of either building above the terminal, or the construction of the tunnel to Market Street. Also not included in the estimate for the architectural finish of the terminal (tile walls, restrooms, ticket sales areas, etc.) It is assumed that this is a part of the project that should be the responsibility of the developer of the adjacent development.

Cost Estimation Methodology and Sources and Procedures

Cost Source A -

**Peninsula Commute Service San Francisco Downtown Station Relocation -
Capital Cost Estimating Methodology and Results
Morrison-Knudsen Engineers, Inc
December 1989**

Item	Unit	Cost
Backfill	Cubic Yard (cu/yd)	\$11.00
Concrete *	Linear Foot (ln/ft)	varies
Demolition	Square Foot (sq/ft)	\$25.00
Dewatering -		
Bay Mud	Linear Foot (ln/ft)	\$340.00
Fill	Linear Foot (ln/ft)	\$200.00
Rock	Linear Foot (ln/ft)	\$25.00
Elevator*	Each (ea)	varies
Escalator*	Each (ea)	varies
Excavation-		
Bay Mud	Cubic Yard (cu/yd)	\$25.00
Fill	Cubic Yard (cu/yd)	\$15.00
Rock	Cubic Yard (cu/yd)	\$22.00
Fencing	Linear Foot (ln/ft)	\$30.00
Finishes*	Linear Foot (ln/ft)	varies
Guardrail	Linear Foot (ln/ft)	\$28.00
Haul Excavated Material-		
Bay Mud	Cubic Yard (cu/yd)	\$6.00
Fill	Cubic Yard (cu/yd)	\$4.50
Rock	Cubic Yard (cu/yd)	\$1.50
Paving & Resurfacing*	Square Foot (sq/ft)	\$3.29
Shoring*	Square Foot (sq/ft)	varies
Signaling & Control	Mile (mi)	\$470,000
Station Electric & Lighting*	Linear Foot (ln/ft)	varies
Trackwork-		
Ballasted Track	Track Foot (tk/ft)	\$100.00
Direct Fix. Track	Track Foot (tk/ft)	\$140.00
Remove Existing	Track Foot (tk/ft)	\$25.00
#15 Turnout	Each (ea)	\$48,000
Grade Crossing	Track Foot (tk/ft)	\$280.00
Bumper Post	Each (ea)	\$5000.00
Tunnel Lighting	Linear Foot (ln/ft)	\$13.50
Underpinning	Linear Foot (ln/ft)	\$290.00
Utilities-		
Repair	Linear Foot (ln/ft)	\$50.00
Replace	Linear Foot (ln/ft)	\$235.00
Support	Linear Foot (ln/ft)	\$130.00
Ventilation-		
Tunnel	Linear Foot (ln/ft)	\$675.00
Station	Linear Foot (ln/ft)	\$515.00
Waste Material-		
Bay Mud	Cubic Yard (cu/yd)	\$4.50
Fill	Cubic Yard (cu/yd)	\$1.00

* Items with an asterisk are estimated using MKE average costs applied to similar types of construction in the Norton proposal. These items include the addition of many unit costs to arrive at a single construction cost. Description of specific cases follow.

Concrete - Two types of cost estimation are employed to develop the estimated unit costs for concrete. Some costs are estimated by applying specific MKE concrete cost estimates to similar segments of the Norton Proposal. In cases where the average unit prices would likely vary between the MKE proposals and the Norton proposal, due to the three track configuration of the Norton proposal, a multiplier was applied to the MKE unit cost. The multipliers are based on the differences in the areas of the construction sections between each segment in the MKE proposals and the Norton Proposal.

Example 1 - Concrete Unit Costs for Segment 1

Construction type: At-Grade
MKE segment comparison: Segment 1
MKE estimated cost per linear foot for concrete: \$47.00
Norton cost: \$47.00

Example 2 - Concrete Unit Costs for Segment 4

Construction type: Cut and Cover Tunnel
MKE segment comparison: Segment 6
MKE estimated cost per linear foot for concrete: \$5,581
Norton cost (MKE \$ x 1.25): \$6976.25

Finishes - As with the case of concrete, the MKE estimated cost for station finishes is comprised of a number of specific item costs. In the MKE proposal for a Mission Bay Station, the finished areas include station entrances, a mezzanine level, and the platform level. In calculating the cost for the Mission Bay Station in the Norton proposal, the MKE average lineal cost was used for estimating the cost of the station. The assumption was made that the elimination of the mezzanine level resulted in a total space equal to or less than the additional station width.

Paving & Resurfacing - The cost paving and resurfacing streets damaged by cut and cover tunnel construction is based on adapting the unit costs from the MKE proposals to specific segments in the Norton proposal. The area of each pavement section to be reconstructed is found by calculating the square footage of the pavement that will be removed by excavating (cutting) the cut and cover tunnel, and multiplying that area by 1.5. Additionally, streets in the Mission Bay Project area that area planned to be abandoned (i.e. King Street west of Sixth) are not included in the costs for Paving and Resurfacing.

Shoring - Shoring costs come directly from the MKE segment costs. The area of shoring to be used is determined by calculating the square footage of each side of the open excavation (2(cut depth x cut length)) and each end of the cut (2(cut depth x ROW width).

Station Electric & Lighting - see Finishes

Elevator / Escalator - Elevator and Escalator costs for the Norton proposal are identical to those in MKE proposals for all cases, except for equipment designated for access to the upper level of the Downtown Terminal. Because of the addition vertical distance, MKE costs for escalators and elevators are multiplied by 1.5.

Cost Source B -
High Speed Trains for California-
Strategic Choice: Comparison of Technologies and Choice of Route
CalSpeed California High Speed Rail Project, Peter Hall, Dan Leavitt, and Erin Vaca
June 1992

Item	Unit	Cost	Multiplier
Short Span Bridge*	Each (ea)	\$750,000.00	CalSpeed cost x 1.5
*per track			
Standard Bore Tunnel	Linear Foot (ln/ft)	\$19,900	CalSpeed cost x 1.0 BART costs x 1.7
Viaduct (lower level)	Track Foot (tk/ft)	\$2000.00	CalSpeed cost x 1.50 BART-Dublin x 1.7
Viaduct (upper level)	Track Foot (tk/ft)	\$3000.00	CalSpeed cost x 1.25 BART-Dublin x 1.8
Service Building*	Each (ea)	\$3,000,000	CalSpeed cost x.5*
*light service & cleaning only			

All of the above costs are in 1992 dollars, and are not adjusted to 1988 dollars. This results in substantially higher base prices when applied to cost estimations based on 1988 dollars. For example, the ln/ft cost of \$19,900 for Bored Tunnel Construction-

CalSpeed Cost (1992 \$)	\$70 Million	per double track mile
	\$35 Million	per single track mile
	\$105 Million	per triple track mile
	\$19,900	per triple track foot
Norton Base Costs (1988 \$)	\$19,900	per triple track foot
Norton Esc. Costs (1992 \$)	\$29,140	per triple track foot

As is evident, the use of 1992 costs applied to 1988 costs provides an additional 45% escalation the CalSpeed costs.