Replacement Parking for Joint Development:
An Access Policy Methodology

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Chapter 1. Introduction

This report suggests a method for developing access and replacement parking strategies for BART's Joint Development Program. The sections that follow summarize the context for this issue, identify problems associated with current replacement parking practice, propose general principles for access/replacement parking, and recommend an access/replacement parking methodology.

The approach taken here leaves room for different station-level solutions. Station context, joint development strategy, and BART system objectives have a bearing on access/replacement parking approaches. The use of performance-based principles is a departure from the uniform nature of the current 1:1 replacement practice. The methodology takes into account issues such as ridership, fiscal health, access mode split, system capacity, supporting Comprehensive Station Plans, and local and regional context. The method relies on BART staff, in collaboration with local cities, transit agencies, and developers, in generating and evaluating alternative access/replacement parking scenarios for recommendation to the BART Board.

The approach has been developed in consideration of the replacement parking questions likely to be faced at the Concord, El Cerrito del Norte, MacArthur, and San Leandro stations. These stations were identified by BART staff as typifying the variety of replacement parking circumstances. The report uses these stations as prototypes for testing the methodology.

BART Context

BART is a major land owner in the Bay Area. Moreover, its land assets are in strategic, high value locations in their respective communities. Land that is currently devoted to parking generates revenue from the fares paid by auto access commuters. The parking itself frequently does not generate revenues, and in fact creates operating costs for BART. BART's land assets can generate additional revenue for BART, either through parking charges, additions to parking supply, ground rents from joint development, or a combination of these elements. The key to unlocking this revenue potential is to find creative access/replacement parking solutions that are "win-wins" for BART, local communities and other stakeholders.

Issues concerning access and replacement parking should be viewed from a long-term perspective since they affect the use of BART land assets, BART operations, and ridership. Looking forward twenty years, the following issues are likely to be influential:

- Recovery of ridership to the levels seen in 2001 and even greater growth. Roadway congestion will provide an increasing travel time advantage to BART in the future. This higher ridership may tax BART's line haul and access capacity but strongly supports regional objectives.
- Increased use of parking management techniques at BART stations, ranging from reserved parking programs, to real time information systems, to parking charges.
- Increased interest in transit-oriented development, driven by changes in demographics, consumer preferences, land shortages, and planning efforts for livable communities.
- Need for stable, unrestricted revenue sources to augment fare and grant revenues.

In sum, the coming twenty years are likely to be much different than the previous period. Hard choices will be needed to allocate BART land resources to parking or to station area development.

BART has a long-standing practice of requiring 1:1 replacement parking. The 1984 *Station Area Development Policy* seeks an economic return from joint development, over and above replacement parking. It allows for parking goals on a line segment rather than station-by-station basis (see Appendix A). The 2003 Strategic Plan *Access Management and Improvement Strategies* allows for variation from 1:1 replacement: "parking…could be increased or reduced to achieve higher ridership in the context of overall station area development and access planning." The intention was that specific guidance on access targets and other implementation issues would be developed under the Access policy. Finally, replacement parking is an important issue for local and regional governments concerned about land use, community development, and transportation conditions.

Problems

A systematic method is needed to address replacement parking questions in the broader context of a multimodal access policy. Such a method would respond to the following problems:

- The 1:1 replacement parking practice is an impediment to many joint development projects. There are many requests for exceptions. Uncertainty about the policy may impede development. The replacement parking issue and the value capture issue appear to be linked, but strict replacement provisions are only one way of capturing value.
- Replacement parking for projects can cost $20 - $30 million. Often, private and/or public resources are not sufficient to fund replacement parking, which prevents otherwise desirable joint development projects from being implemented. At many stations, insistence on full replacement parking will delay joint development for many years. Furthermore, it is unlikely that external funding will become available for replacement parking on a widespread basis.
- The current replacement parking practice is out of step with BART's policy direction because it is focused on only one access mode (those who drive and park) and it is not performance based.
- Replacement parking requirements could be specified in the Comprehensive Station Plans and access plans, but they require a more detailed methodology to support policy and they would require a collaborative solution with each local land use authority.
- Quantified access targets exist only at the system level; more specific guidance to access priorities on a station or line basis is not yet available. In the meantime, BART's Real Estate department needs guidance for moving forward with development solicitations and the Access Department seeks more specifics on the targets for parking, bike lockers, bus bays, etc. needed at each station.
- Currently, the land on which BART parking sits generates operating costs for BART (parking) but no direct return, except for reserved spaces, the long-term parking program, and daily paid parking in the West Bay. There is a substantial opportunity cost in devoting this land to a use that generates no direct return, as compared to the land rent

that a development project could generate. (Of course, one must recognize the fares generated by those who park.) It should also be recognized that parking has a substantial revenue generating potential in high demand areas, as evidenced by the rate charged in some private parking facilities next to BART stations.

The Ridership Loss Issue

A key issue with not fully replacing BART parking is the possibility of ridership loss. By way of introduction, assume one acre of surface parking is eliminated in favor of joint development. As a surface parking lot, one acre provides 124 spaces. That number of spaces might create 136 daily boardings at that station under the assumptions reviewed in later sections. If half of these boardings are lost because BART riders are unable/unwilling to find an alternative BART access mode, then BART would lose 68 daily boardings or 136 daily rides (assuming two daily trips per station boarding). If the surface parking is replaced by residential development at 60 units per acre, then those residents would generate 66 rides per day under the assumptions reviewed later. Therefore, unless densities are high and alternative BART access modes are convenient, pure residential replacement of surface parking is likely to result in a modest ridership loss.

The scenario described above *is not* a reason to reject scenarios that involve less than 1:1 replacement parking. Usually the question is not either/or, parking or development, but what level of replacement parking is appropriate. Applying a density that is acceptable to the community to an entire surface parking lot, combined with partial replacement parking, will produce ridership gains. New access programs can also retain a higher share of BART riders. In addition, there are other significant benefits to joint development, such as generating ground rent for BART, securing capital improvements for BART, generating new riders during the mid-day, creating a safer, more secure station environment, etc. There are also system capacity benefits, because joint development has demand patterns that have a lesser share of peak period travel, in contrast to the sharp peak produced by commuters seeking the available parking spaces early in the peak period.[1] On the other hand, even though most BART spaces do not generate revenue for BART at this time, they will also become increasingly valued in the future, as the ratio of spaces to riders declines. The existing inventory of parking may be able to generate significant additional revenue in the future.

Access/replacement parking decisions interact with joint development feasibility in numerous ways. For example, reducing the burden of replacement parking might make a joint development feasible with partial replacement parking and therefore lead to a development that otherwise would not be possible. The net effect would be ridership gain. Alternatively, an increase in development intensity might create project revenues that permit full replacement parking and ridership gain.

[1] The California TOD report indicates that close to 50% of work trip commutes by BART TOD residents occurred after 9:00 AM (Table 5-10, page 50).

Process for Developing this Methodology

The issue of replacement parking affects multiple departments within BART (Planning, Real Estate and Access) as well as local cities, developers, transit operators, and the community. This methodology was developed in a sequential manner that incorporated the views of those constituents. First, principles to guide replacement parking issues were discussed by BART managers representing the affected internal departments. Then input was sought from four cities that would serve as test cases for the methodology. In August 2004, informational meetings were held with planning staff from the cities of Concord, Oakland, El Cerrito, and San Leandro. Finally, input was sought from developers, cities, transit operators, community members, funding partners, and elected officials in a series of workshops organized as part of the BART's Joint Development Policy Review panel.

The general reaction has been support for BART moving toward a new approach to replacement parking. Some of the themes that emerged in the discussion include the following. First, replacement parking decisions affect many stakeholders and require an approach that involves those multiple stakeholders. The approach taken here is to develop a tool to support BART working with those stakeholders rather than produce a single "right" answer in isolation. A second theme that emerged was the importance of gaining local community support for both joint development and replacement parking, and learning that there is variation in the community "starting points" for considering these issues across the region. Finally, an important concern is coordinating these decisions with transportation plans of other entities, such as bus operators and providers of alternative access modes. Expectations about future station access by modes other than driving and parking are an important factor in the methodology. Ideally, use of this methodology would spur the development of station specific access targets or other forms of station access direction that BART could develop in conjunction with local partners.

The methodology is intended to assist in assessing replacement parking and joint development scenarios that are typical in BART's service area. If there are proposals that involve different land uses than those examined here (residential, retail, and medical office) the methodology can be augmented to include other land uses or joint development circumstances.

Chapter 2. Proposed Principles to Guide Replacement Parking

Tables 1 and 2 suggest principles to guide decisions about access and replacement parking. They are elaborated in the methodology that follows. The principles are presented as process principles (Table 1) and outcome principles (Table 2). They are intended to provide a structured way of evaluating access/replacement parking scenarios.

Table 1. Process Principles

Process Principles	Discussion
1. BART will consider replacement parking as an integral element of BART's system- and station-area access policy.	Access policy/replacement parking strategy for a station depends on the characteristics of the station and line segment, BART system capacity, community goals, etc. At the broadest level, access/replacement parking decisions should help carry out Strategic Plan policies.
2. In considering access and replacement parking arrangements, BART seeks the creativity of the development community, local transit partners, and the support of the local community.	One-for-one replacement provides no opportunity for innovative access/replacement parking arrangements that trade costs and risks of different types. For example, alternative access improvements might provide a greater level of access and ridership in situations where replacement parking is very expensive.
3. Decisions on access and replacement parking should provide transparency and predictability to all parties in the development process.	The one-for-one replacement policy is clear and well understood. However, recent exceptions have begun to diminish this clarity. Any new approach should provide transparency, so that stakeholders can understand how decisions are made, and predictability, so the development community and local communities can make long-term plans.

Table 2 (next page) suggests outcome principles to guide access/replacement parking decisions. Although these principles are not weighted or prioritized, increasing ridership is the most clearly articulated principle from Strategic Plan and Access Framework documents.

Table 2. Outcome Principles

Outcome Principles	Discussion
1. The net effect of any access/replacement parking decision should be to increase BART ridership.	This report develops a process for assessing the net ridership impact of a variety of access/replacement parking scenarios. This principle flows from the Strategic Plan's "Land Use and Quality of Life" Goal 1 (maximize transit ridership) and "Customer Experience" Goal 2 (maximize access, convenience, ease of use).
2. Access/replacement parking decisions should support the fiscal health of BART.	There are multiple ways in which this can occur, such as fare revenue, ground rent, revenue from parking charges, or reductions in BART's operating costs. See the Strategic Plan's "Financial Health" Goal 2 (financial base).
3. Access/replacement parking decisions should, taken as a whole, support BART's goal of gradually reducing the share of station access by those who drive alone and park.	In increasing the number of riders within walking distance, large scale joint development will decrease the drive alone share at most stations. The key policy question is the degree to which station parking will continue to be accommodated. Because of the magnitude of the expected ridership growth, a continued decrease in the *share* of those who drive to BART and park may still mean that the actual number of parking spaces may increase. See the Strategic Plan's "Transit Travel Demand" Goal 3 (10% shift in access modes) and BART's Access Targets.
4. Access/replacement parking decisions should support the long-term management of BART's system and station capacity, recognizing that long-term growth in ridership will put pressure on all access modes.	BART needs to consider the ramifications of access/replacement parking decisions over the long term, because expected growth in ridership will put pressure on all access modes. BART should preserve its ability to respond to changes in transportation and land use conditions. Congestion pressure is likely to lead to a greater shift to transit use and non-automobile access. On the other hand, parking resources will be in high demand and able to generate more economic return than they do today. Managing the use of BART parking also provides a direct way of managing system demand (e.g., all-day versus mid-day spaces). BART should develop station-level access forecasts and targets in support of this methodology. See Strategic Plan "Transit Travel Demand" section (off-peak, reverse commute travel; supporting transit-oriented development).
5. Access/replacement parking decisions should contribute to achievement of the priorities established in Comprehensive Station Plans (CSP), access targets, capacity, and joint development strategies as they are developed.[2]	Station area development and joint development is most effective when it is broadly supported by BART's policies. For example, some stations might be a high priority for parking while others are appropriate for a transition to non-automobile access. Successful joint development requires that projects be financially feasible after all mitigation requirements are applied. See Strategic Plan's "Land Use and Quality of Life" Goals 1 and 2 (TOD strategies).

[2] The land use element of the CSP summarizes provisions from locally adopted land use plans. They do not introduce a land use plan around a station that differs from what is locally adopted. Proposed changes to station land are developed in collaboration with the local authority. Therefore, the land use elements of the CSPs are consistent with the local plans criterion discussed in Outcome Criterion 6.

Table 2. Outcome Principles (continued)

Outcome Principles	Discussion
6. Access/replacement parking decisions should have the effect of encouraging context-appropriate and well-designed joint development projects that have the support of local cities and community groups around stations. They should be supported by modifications in local requirements to support TOD.	Since land use and local circulation is the purview of local government, access/replacement parking decisions should produce developments that address their concerns while enhancing long-term value capture for BART. Recognizing community preferences can improve the quality of TOD projects. In turn, local ordinance provisions regarding minimum parking requirements, mixed-use development, and density should support replacement parking decisions. See Strategic Plan's "Land Use and Quality of Life: Goals 1 and 2 (TOD strategies).
7. Access/replacement parking decisions should support regional objectives concerning growth management, housing provision, housing affordability, transit ridership, traffic congestion reduction, air quality, water quality, etc.	Transit-oriented development supports most of the regional objectives concerning the growth management, housing, transportation, and the environment. See Strategic Plan's "Land Use and Quality of Life: Goals 1 and 2 (TOD strategies).

The methodology anticipates that there may be additional criteria that apply to specific station areas and allows for that possibility. An example issue is that the parking resources of a station, while currently generating little revenue from parking charges, might have the potential to generate significant revenue from parking in the future. Reducing the BART parking inventory at such a station may have the effect of precluding that revenue generation in the future. Of course, if the demand for parking is high enough, there would be a justification for acquiring additional land and constructing additional parking at that time. If this is an issue at a particular station, a criterion addressing lost revenue potential of priced parking could be introduced. Similarly, if a station had particular environmental justice issues relating to access to BART, an environmental justice criterion could be included.

Chapter 3. A Methodology for Access/Replacement Parking Analysis

The tasks, tables and checklists that follow propose a process for BART staff in developing recommendations concerning access and replacement parking for joint development projects. This process is also intended to provide developers and other stakeholders with an indication of the way BART will approach these issues on a site specific basis.

Step 1. Policy and context issues
Step 2. Build scenarios
Step 3. Evaluate scenarios
Step 4. Select preferred strategy and write specifications

Step 1. Summarize key policy and context issues

The first tasks are to collect the information shown in Table 3 for the station in question and conduct an assessment of replacement parking issues as shown in Table 4. As part of this process, an inventory of other types of access improvements, such as bus, shuttle, taxi, drop-off, car share or ridesharing should be developed.

Table 3. Station Information Profile

Category	Characteristic	Condition
Station characteristics	Station type	
	Transportation function	
	Station weekday ridership '04 (exits)	
	Average weekday round trip fare paid from station	
	Weighted average service density	
	Station draw	
Station area characteristics	Population w/in ½ mile	
	Employment w/in ½ mile	
Parking	BART parking	
	Parking utilization @ 1 PM	
	Reliance on parking (number of BART spaces per weekday rider)	
	Other parking-related access issues, e.g., overflow parking	
Other access modes	Transit	
	Shuttles	
	Pedestrian	
	Carpooling	
	Bicycle	
BART Plans	Access plan?	
	Comprehensive Station Plan?	
City Plans		
Transit Operator Plans		
Status of development solicitation		

A variety of BART data sources would be used to provide information on station characteristics. Census tabulations provide station area characteristics and could be supplemented with local data. The most recent information on trip making for those who drive to the station is the addresses of people who participate in the BART reserved parking program. A map showing the distribution of these addresses indicates the station "draw" and the possibilities for shifting parking demand to other stations. This data might have bias in that those who participate in this program may have a higher average income than all of those who park at BART stations. A second data source for this information is the 1998 BART patron survey, which shows access patterns of all station patrons. When this survey is replicated it will provide an updated measurement of the draw of each station. When a joint development is proposed, there are opportunities to require station specific surveys of station access modes.

Regarding parking, an example of an "other parking-related access issue" might be the availability of underused surface or structure parking in the station area, or available land that might provide parking in a more efficient manner than the BART station-area parcels.

Additional station area information may be appropriate for display in Table 3, such as distance to major collector streets and freeways and a congestion rating for the station area. This information could be produced as part of BART Access Plans or city/developer studies of access.

Table 4. Replacement Parking Possibilities

Issue	Status
Is station parking fully utilized?	
Is nearby, non-BART parking fully utilized?	
Can replacement parking be provided off-site or using shared parking arrangements?	
Can parking demand be shifted to other stations?	
Are there possibilities for replacement parking funding from other parties (e.g., grant funds, redevelopment)?	
What is city perspective on deviation from 1:1 replacement parking?	
What other planning issues exist?	
What is the parking management readiness in the station area, i.e., cities and property owners have spillover prevention programs ready (e.g., permits, meters, time limits)?	

Each of the replacement parking possibilities may require elaboration. For example, if shared parking is possibile, the analysis should consider the degree of control over the parking by BART, the allocation of revenues and expenses, and operations and management. It may be that some types of parking are not suited for sharing with commuter parking (e.g., residential parking) while others are a better fit (e.g., movie theatre parking).

From this information, the analyst would then summarize the top five policy context issues for the station, in rank order. Table 5 would summarize the station and joint development context. A key element for BART is assessing whether local partners (cities, transit operators, etc.) are willing to make decisions that will support the replacement parking scenario being considered by BART.

Table 5. Top Five Station Policy and Context Issues

Issue	Relevance to the Access/Replacement Parking

From this analysis, BART staff, working with the local land use jurisdiction, would determine if there are additional criteria that should be used in the evaluation of access/replacement parking alternatives. Those criteria would be added to Table 9.

Step 2. Build scenarios

The method proposed here involves building a series of development and access/replacement parking scenarios. The first step is to summarize the general parameters of the joint development

proposal. The parameters would be based on assessments of market demand in the station area, developers' proposals, city plans and regulations, and BART's broader station objectives.

Table 6 would be used to summarize key information on development size and parking for the joint development project. This can be done in two ways. First, the *same* joint development project could be assumed under all access/replacement parking scenarios. By holding development size constant, one can isolate the effect of the different access/replacement parking scenarios. Alternatively, the scenarios may include different development and access/replacement parking scenarios. The latter process may be more realistic since replacement parking alternatives affect development feasibility, site design and many other factors (e.g., a relaxed replacement parking obligation might free up more site area and local traffic capacity for housing). Conversely, permitting more development intensity will create a higher level of financial return for the developer, which in turn would make more resources available for replacement parking.

The scenarios may also involve different approaches to parking for the joint development itself, stemming from assumptions about changes in automobile ownership and travel associated with households living near transit. The category "parking spaces provided for joint development" would reflect any assumed adjustments to standard city code requirements. Note that these tables do not include traffic impact analysis—it is assumed this information would be provided through separate studies by the city and the developer. It is important to note, however, that adjustments to standard trip generation rates may be appropriate given assumptions about parking supply, pricing and the mixed-use nature of the scenarios.

This methodology suggests that three scenarios be developed for testing, but this is not intended as a rigid procedure. Depending on circumstances, between two and five scenarios might be developed. The idea is to have interaction between BART departments, and between BART and city partners, the development community and local transit providers in creating scenarios. It is likely that there would be multiple iterations in creating these scenarios and plenty of trial runs to converge on a set of scenarios that are both realistic and innovative.

Table 6. Joint Development Scenarios

	Existing Condition	Scenario A	Scenario B	Scenario C
Size of development parcel				
# units residential (rental)				
# units for sale housing				
Retail (sf)				
Other land use (sf)				
# of BART parking spaces on development site				
Unused spaces at BART station assumed to be available for those displaced by development				
Off-site replacement of BART spaces (in station area)				
BART patron parking resources at another station area (BART or non-BART facilities)				
Parking spaces provided for joint development				
BART parking spaces shared with the joint development				
Total non-shared spaces provided (BART + joint development)				
Parking charges on the BART parking				
New transit/shuttle programs				
New carpool program/ incentives				
New walk/bike programs				
New on-street parking management programs (e.g., permit or time limits)				
Other access improvements				
Economic issues				
Local barriers to TOD and how they are addressed				

Step 3. Evaluate scenarios

Having built three development and access/replacement parking scenarios, the next step is to evaluate those scenarios against the proposed principles. The first task is to assess ridership effects, according to ridership loss/gain by changes in existing station parking, and ridership gain associated with the joint development project and other factors. Appendix B provides spreadsheets for trip generation from joint development, ridership impact from parking pricing, and ridership impact from changes in station parking supply.

The steps used in estimating **ridership from the joint development** include building assumptions about trip rates from the ITE Trip Generation rates, then dividing trips into work and non-work trip purposes, and then applying a mode split assumption to those trips. This yields the number of BART trips expected from the joint development. The spreadsheets allow

for the use of locally preferred methods. For example, if a city prefers to use 7th Edition trip generation rates (instead of the 6th Edition) they can easily be adjusted. If local data exists that suggest different rates, or different mode splits, those can be applied as well.[3] The reliance on adjustment factors to ITE rates point out the need for TOD-specific trip generation rates that can be matched to station characteristics. It is hoped that future research initiatives will provide this data for the Bay Area.

The percent of BART capture is derived primarily from the *Travel Characteristics of TOD in California* report, with adjustments noted when station conditions differed from the project studied in that report. TOD trip generation and mode split is an area where expert judgment is needed, because the impact of development near stations can vary significantly (e.g., there is a large difference in automobile and transit trips between a true TOD with significant transit use versus what is often termed as a "transit adjacent development" that is located next to transit but has little functional relationship).

The steps used in estimating **the impact of parking charges** are based on the parking conditions at the station. If station parking is 90% full by 9:00 AM, it is assumed that latent demand would replace riders who stopped using BART because of parking charges. If parking is not 90% full by 9:00 AM, the methodology applies an elasticity to the combined fare and parking charge to estimate the number of boarders potentially lost. The methodology then asks the analyst to consider likely shifts to other BART access modes and estimate the expected ridership loss. Key assumptions in this methodology are the elasticity and the percent of potentially lost BART riders who find another access mode.[4]

The steps used in estimating **the impact of changes in parking supply** are based on the parking conditions that exist at the station. If there are unused spaces at 9:00 AM that exceed the amount of the parking space reduction, there is no net reduction. If there is a net reduction or increase, the methodology considers space turnover, persons per car, and potential diversion to other BART access modes in estimating impact on ridership loss (or gain).

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[3] The trip generation rate used for apartments is 6.63 trip ends per unit, which when divided between work and non-work trips (at a 25/75 split), produces 1.65 work trips per unit. One might expect at least two work trip ends per household, if each household included a worker. The following describes some reasons why this is *not* supported by the data.

- TOD households, like apartment households, are smaller than average (83.2% of households in the *Travel Characteristics of TOD in California* study were between 1 and 2 persons, compared to 58.1% in the comparison cities). Smaller households have fewer workers, fewer work trips, and fewer total trips.
- Not all households have a worker (age, employment status). For example, *Travel Characteristics of TOD in California* asked respondents to be the primary worker in the household, but 6.1 percent of respondents did not report a work trip as one of their three main trips.
- Among household workers, some work at home (about 4 percent in the Bay Area).
- Among household workers, not all workers who work outside the home make a trip **on a given day** (absenteeism, vacations, alternative work schedules, part-time work). ITE rates measure actual trip generation on a specific day, not the potential generation if everyone who worked took a work trip that day.

Further research is needed on TOD trip generation rates. The effect of this methodology is to be conservative about estimating the possible ridership gains from joint development. This is a prudent position given the state of research on this subject. Should additional trip generation studies become available, they can easily be incorporated into the methodology.

[4] The case studies use the station access mode split identified in the 1999 BART Station Profile Study as a basis for estimating shift to other access modes.

The assessment of ridership and parking impacts must be based on assumptions about the control of spillover parking. If on-street parking regulations do not prevent spillover parking, impacts could occur and should be assessed. In those situations, the analysis may recommend parking spillover control measure as part of the scenario (e.g., permit parking programs, parking time limits, etc.).

Table 7 would be used to summarize the results of these analyses. The scenarios express the change from the existing conditions. There is opportunity in this methodology to incorporate local data, if for example, a developer commissioned access studies and to develop refinements to the processes or assumptions in the ridership impact procedures.

Table 7. Joint Development Ridership Impact

	Scenario A	**Scenario B**	**Scenario C**
Weekday riders associated with joint development	*Quantitative*	*Quantitative*	*Quantitative*
Change in weekday riders associated with parking/access programs	*Quantitative*	*Quantitative*	*Quantitative*
Net impact on BART boardings	*Quantitative*	*Quantitative*	*Quantitative*
Estimated effect on drive alone share at station	*Qualitative*	*Qualitative*	*Qualitative*

The next step is to understand the impacts of the scenario on BART's fiscal position. **Note that this does not consider the fiscal issues of other entities, such as cities or bus operators. It is assumed that they would do their own analyses as they enter into negotiations with BART over joint development strategies.** A city's calculations would consider issues such as effects on property and sales taxes, user fees, demands for services, etc. Of course, the replacement parking issue may be approached by BART and the city as a collaborative effort – e.g., applying both ground rent and tax increment to the issue. Bus operators would want to consider revenues and costs associated with tapping a new bus access market. BART would engage these other entities in discussions regarding their own fiscal analysis so that any assumptions that BART makes about development approvals, transit service assumptions, etc. are reasonable.

Table 8 suggests the range of BART fiscal issues that should be addressed (a spreadsheet in Appendix B provides the details). They include the fare revenue impact of changes in station ridership[5], revenue from parking charges[6], revenue from ground rent associated with a change in replacement parking policy, and revenue from partnerships/external grants.

The change in ground rent is the increase in payment possible to BART because of the developer's reduced expenditure on replacement parking. The method used to estimate this number is to make an estimate of fair market land value and subtract the capital cost of

[5] Daily ridership is converted to annual ridership using a factor of 296 recommended by BART. Revenue calculated as gross annual fare times 0.9 to account for discount fares, per BART.

[6] BART Access Department recommends a capital cost of $147.50 per space for parking/add fare machines and signs, and collection. This capital cost is annualized using a 0.15 factor. Operating costs, including collection, enforcement and O&M is assumed to be 10% of revenue for monthly reserved program and 30% of revenue for daily paid parking.

replacement parking. The residual is then multiplied by the BART ground lease guideline of 10 percent to estimate ground rent. This approach assumes development feasibility and normal developer profit without the replacement parking obligation. **The ground rent revenue does not include BART's participation in other revenue streams *or* the greater level of ground rent that is possible if higher development intensities are permitted or the impact of reduced parking requirements for the joint development itself.** More detailed market demand and pro forma feasibility analyses are required to identify the total ground rent and other revenue stream implications of each scenario.

The spreadsheet also allows the analyst to provide assumptions on parking capital costs and the annualization factor. Table 8 can also account for changes in BART's operating costs, for parking[7] and other direct BART capital or operating access expenditures (e.g., running a new bike program). If shifts to other access modes such as bus service are assumed in the estimations of parking pricing or supply reductions, the costs of added service should be calculated if capacity does not presently exist on those modes. Finally, maintenance costs associated with a shift from surface parking to parking structures should be added to Table 8. All data reported in Table 8 represent the change from existing conditions.

Table 8. BART Fiscal Checklist

		Scenario A	Scenario B	Scenario C
Annual revenue factors	Fares from net change in station riders			
	Parking charges (net)			
	Ground rent associated with change in replacement parking			
	Annualized value of external grant/partnership support for parking development			
Annual cost factors	Change in operating costs for BART parking (maintenance, security)			
	New operating costs for BART service			
	BART part. in operating costs for new access modes			
	BART participation in annualized cost of access capital improvements			
Net annual impact (sum of revenues and costs)				

This process includes qualitative analysis of four other factors as shown in Table 9: long term BART capacity, the degree to which the scenario supports BART's plans, the degree to which

[7] Parking operating costs are estimated at $353 per year for surface spaces and $537 per year for structures, based on BART data inflated to 2004 dollars. The methodology accounts for parking operating costs associated with the change in the number of BART parking spaces and any shift from surface to structure parking (which increases the per space operating cost).

the scenario supports local partnerships for context-appropriate development, and the degree to which the scenario supports regional goals.

With regard to **long-term BART line-haul capacity**, the cost of added riders is zero if capacity exists on the lines serving the station to accommodate the joint development ridership without additional capital or operating cost. This is justified for many existing stations because: 1) current ridership is below peak levels of the late 1990s, indicating physical capacity exists, and 2) the CA TOD study indicates that almost 50% of BART TOD commuters commute after 9:00 AM, suggesting that significant joint development ridership demand will be outside the peak period. Of course, there may be circumstances where joint development does necessitate improvements to line or station capacity. Under these circumstances, these costs should be estimated and included based on BART's capacity studies and engineering estimates.

There are also issues associated with **long-term station access capacity** that should be considered. For example, by doing a sensitivity analysis on the access mode shift that would be required by growth in ridership, changes in parking supply, and changes in bus access to the station, BART could analyze the implications of the scenarios for the ability to deliver people to the station over the long term. The long-term prospect for bus service to stations is a particularly significant issue given changes in the funding and service priorities of bus transit providers. This analysis may raise issues concerning the value of retaining surface parking so that at some future point BART could provide more station parking by constructing a structure. This question should be addressed in terms of the opportunity cost of retaining land in surface parking and the possibilities for adding parking or other access capacity outside BART's parcels (using a joint powers authority, for example).

With regard to **support for BART plans**, staff would review the CSP, Access Plans and other BART policy guidance to evaluate the scenarios. Information would be needed on the relation of station opportunities to the surrounding area and other stations. Possibilities for partnerships involving joint power authorities should be considered if they offer opportunities to better locate station area parking and other land uses.

With regard to **local goals, local partnerships and support**, staff would review the local general plan, specific plans, redevelopment plans, ordinances, and capital improvement strategies to make a determination in consultation with the city. In some cases, the city may be reviewing and updating a concept plan or specific plan, which provides an opportunity to raise and resolve access/replacement parking issues. This element also involves examining local partnership opportunities, such as shuttle initiatives. Issues of local street capacity, street classification, existing and projected Level of Service, costs of street improvements, and local parking issues are all highly relevant to the evaluation of the scenarios. From BART's perspective, if significant barriers to TOD exist, such as certain density limitations or excessive parking requirements, the methodology should assess the prospects of reducing or eliminating them.

The final qualitative evaluation criterion concerns **regional goals**. Staff would evaluate the scenarios in terms of the degree to which they support regional goals concerning growth management, transit ridership, air quality, housing, environmental justice, etc.

Table 9: Summary Evaluation Matrix

Criterion	Scenario A	Scenario B	Scenario C
Ridership: net annual ridership impact (from Table 7)			
Revenues and costs: net annual impact, $/year (from Table 8)			
Station access mode: change in drive alone % (from Table 7)			
Long-term BART capacity (line haul, station, and station access)			
BART plans: support access plan and capacity analysis from Comprehensive Station Plans, access targets, joint development goals (qualitative)			
Local goals: Context-appropriate and well-designed; local support, partnerships, reduce TOD barriers (qualitative).			
Regional goals: e.g., provision of housing, housing affordability, congestion, air quality, etc. (qualitative)			
Other station-specific criteria			
Other station-specific criteria			

Rating schemes can be used to convert the quantitative information to rating scales so that all principles are compared on an equal basis (e.g., all information could be rated "+", "no effect", or "-"). However, this loses the precision in the quantitative principles, and that precision might be the critical information in distinguishing between scenarios. Given that the methodology will likely be used collaboratively with decision making bodies and local cities, the presentation method shown in Table 9 provides an open and detailed form of presentation that is best suited to that use.

Step 4. Select preferred strategy and write development specifications

Based on the analysis in Table 9, BART staff, working with local jurisdictions, would recommend a joint development and access/replacement parking scenario. The joint development and access/replacement parking scenario could then be clearly communicated in request for proposals. Clearly, there is interaction between access/replacement parking strategies and the form of the joint development proposal, so multiple iterations of the evaluation method are likely. Because of the complex interplay of factors that affect a joint development, it is not suggested that a scoring system be developed. Rather, the display of evaluation results shown on Table 9 can be used as a basis for staff and Board discussions about innovative and effective access/replacement parking decisions. Detailed market demand and pro forma feasibility studies would be needed to determine with precision the amount of ground rent and other revenues BART should expect from joint development projects. In addition, BART needs a good sense of what the future holds for bus access to the station.

As mentioned, cities, other transit agencies, and other partners would develop their own evaluations. For example, if joint development is made possible on a site that formerly was surface parking, the city will receive property tax returns that otherwise might not have been possible. There may be important changes to be accounted for in sales taxes, bed taxes and other taxes, as well as changes in cost for city services and infrastructure upgrades. Similarly, a bus operator may be able to tap a new market by virtue of a program that improved bus access. Alternatively, if the bus provider plans service reductions because of budget constraints, that would have be factored into the evaluation. Since one of BART's goals in joint development is to collaborate with cities and other parties, the idea proposed here is a sharing of information about each party's respective assessments.

In the past, the replacement parking question has been a critical factor in determining the feasibility of joint development. If this issue is resolved through the evaluation procedure proposed here, there may be more attention devoted to other factors that are acting as barriers, such as local code-required parking, restrictions on mixed uses, height restrictions, density restrictions, use of standard ITE trip generation rates in traffic impact analysis, and local code issues related to roadway widths, pedestrian facilities, and other factors. In addition, stakeholders emphasized the importance of including transit agencies in this process, as uncertainty exists about future service levels.

Based on this evaluation, BART staff would develop negotiation objectives in collaboration with the local jurisdiction that would be included in requests for proposals and would be the basis for negotiations with developers and other parties. It may also be that the process alerts BART, cities and other parties to other planning efforts or new programs or services that are needed before joint development can proceed. As appropriate, this methodology could be shared with developers and local partners as part of an iterative process of project definition. Provisions would be memorialized in development agreements, and those that are ongoing, such as operating access modes, could be written as covenants on the project title.

Chapter 4. Case Studies

Introduction to Case Studies

Access/replacement parking strategy should vary across BART stations, depending on local circumstances. This section explores the characteristics of four stations being used to test this methodology: Concord, El Cerrito del Norte, MacArthur, and San Leandro.

The comparison shown on Table 10 indicates that although the four stations have similar ridership levels, there is significant variation in their reliance on parking. MacArthur, with an urban context and high pedestrian access levels, generates almost 10 trips per day per parking space, while San Leandro generates around four trips per day per parking space. The proportional ridership effect of less than full replacement parking would be less at a station such as MacArthur. Stations with a higher level of transit service, such as El Cerrito del Norte, provide greater access options to any patrons who lose a parking space. There are also differences in the level of BART service and the density of the surrounding areas, with MacArthur and San Leandro having higher levels of BART service. Regarding density, MacArthur stands out with a high population density, while El Cerrito del Norte has a lower-than-average employment density.

Table 10. Comparison of Cases

		Concord	El Cerrito del Norte	MacArthur	San Leandro
Station characteristics	Station type*	Suburban center	Urban neighborhood	Urban neighborhood	Suburban center
	Transportation function	Destination and origin	Origin	Origin and destination	Origin and destination
	Station ridership (exits)**	5,140	7,258	6,028	4,790
	Weighted average service density***	7.6 trains/hr	14 trains/hr	23 trains/hr	21.6 trains/hr
Station area characteristics	Population w/in ½ mile**	4,977	6,206	9,531	7,761
	Employment w/in ½ mile**	5,324	1,711	5,619	5,434
Parking and access	BART parking*****	2,367	2,198	603	1,234
	Parking utilization @ 1 PM*****	90%	100%	100%	100%
	Reliance on parking (space per rider)	0.46	0.31	0.10	0.26
	Percent transit access****	9%	27%	20%	15%
	Percent walk/bike****	13%	13%	31%	20%
	Other access issues	North Concord and Concord have parking available	Station functions as a terminal station because of freeway access	Significant shuttle service from employers; security issues exist	Limited regional street access
Trends	Future changes that affect access/parking	City plans call for denser, clustered development	Possible rail transit extensions in this corridor	Possibility to link MacArthur supply with West Oakland supply	Would be impacted by proposed San Jose service

* From station spreadsheet prepared by the Center for Transit Oriented Development, dated 7/29/04
** From station spreadsheet prepared by F&P Associates, dated 8/2/04
*** Tabulations provided by BART staff.
**** From BART Station Profile Study, BART Office of External Affairs, August 1999.
***** From BART Stations-Parking Facility Occupancy Survey, Wilbur Smith Associates, April 20-May 6, 2004.

The sections that follow apply the methodology to each of the four case study stations.

Concord Case Study

Overview

The Concord station is a former end-of-the-line station on the C Line. BART now provides two stops beyond the Concord station. Pressure on Concord's parking facilities has been moderated by the addition of additional parking resources at North Concord and Pittsburg/Bay Point. This is the only case study station where the parking does not fill completely. Some of the parking is located more than ¼ mile from the BART faregates, which may be a deterrent to its use.

The city and BART are interested in joint development but the replacement parking issue has been an impediment to progress. For example, the Avalon Bay proposal (a response to a BART-issued RFP) called for full ground rent and partial tax increment contribution to fund replacement parking.

There are many possibilities for cooperation/coordinated planning at this station. One possibility is linking the development of BART's southernmost parking lot and the nearby City police parking facility. Also, the city owns a large parcel next to BART's land that could be coordinated with an RFP. Finally, the nearby Bank of America has a large parking facility that might provide a shared parking opportunity.

The City has endorsed an urban concept for downtown. The new General Plan removes some planned road widenings in support of pedestrian access. The main focus for retail uses is the nearby Todos Santos Plaza, not the station area. The downtown area has parking time limits but no parking charges. Figures 1 provides an image of the prospective joint development site. Figures 2 and 3 show the station and parking areas. Tables 11 and 12 and Figure 4 summarize station context, access, and replacement parking circumstances.

Figure 1. Concord Joint Development Site

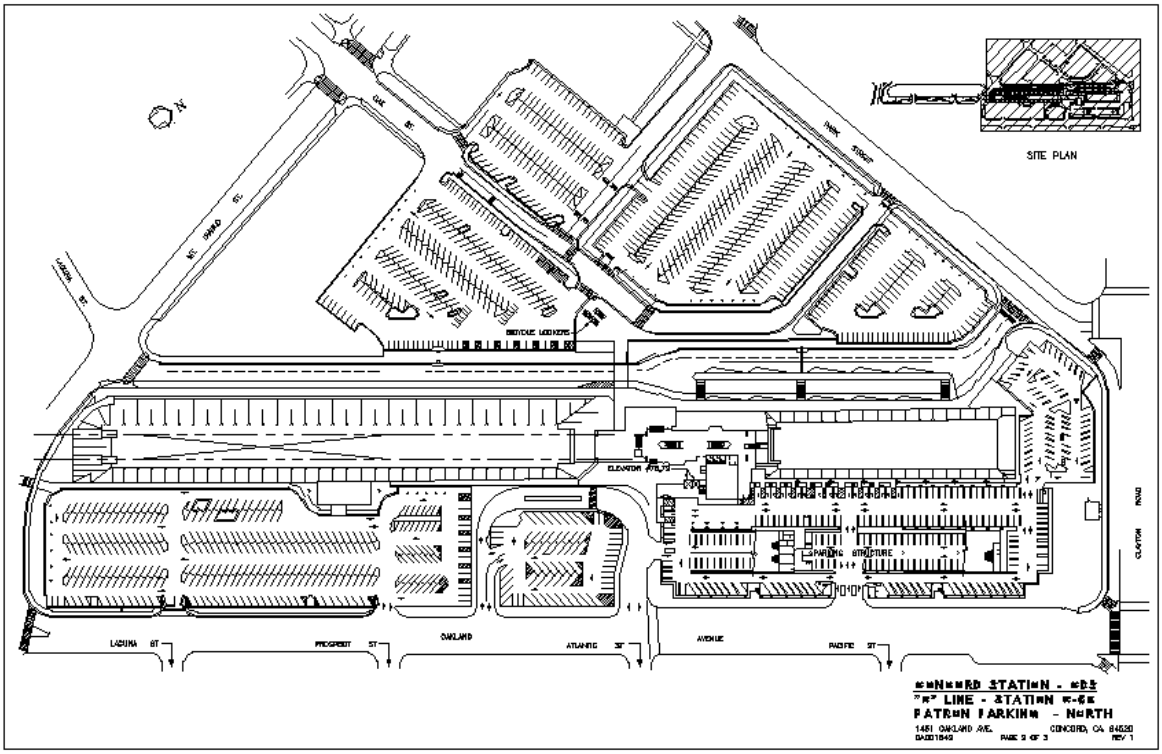

Figure 2. Concord Station and Parking Area (north portion)

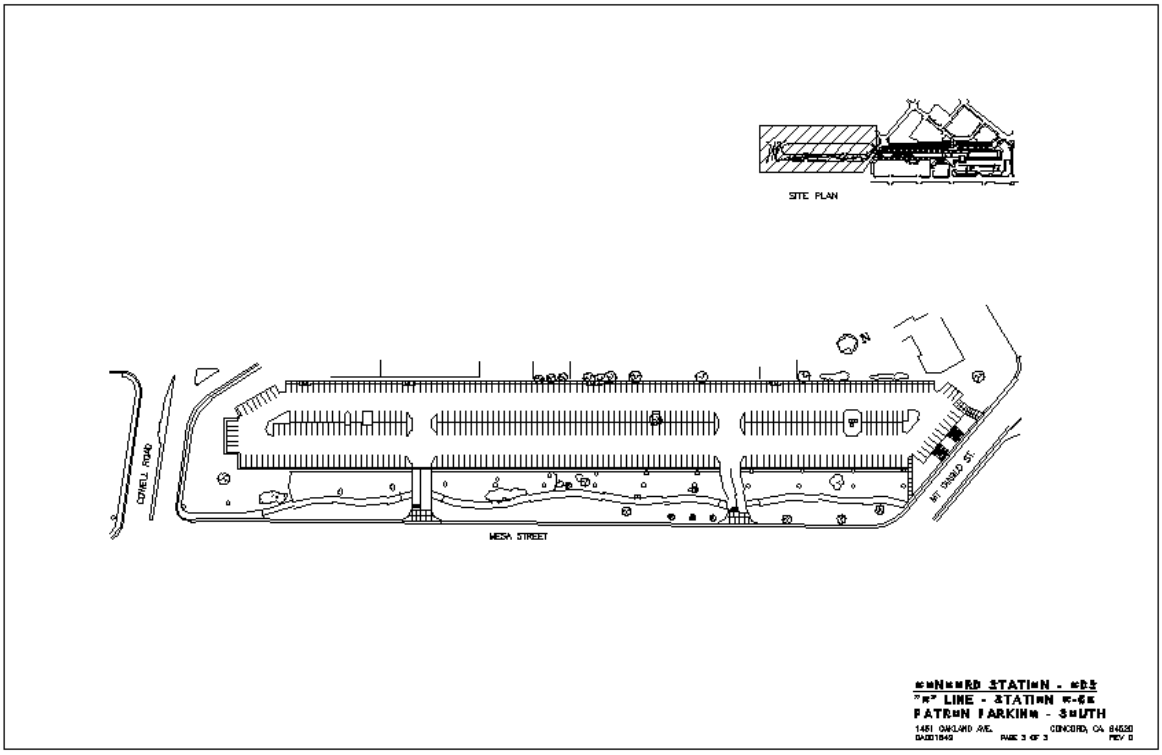

Figure 3. Concord Station and Parking Area (south portion)

Table 11. Concord Station Context

Category	Characteristic	Condition
Station characteristics	Station type*	Suburban center
	Transportation function	Destination and Origin
	Station weekday ridership '04 (exits)**	5,140
	Average weekday round trip fare paid from station	$6.66
	Weighted average service density***	7.6 trains per hour
	Station draw	A one mile radius from station, with a corridor running east-south-east from station for approximately 6 miles
Station area characteristics	Population w/in ½ mile**	4,977
	Employment w/in ½ mile**	5,324
Parking	BART parking*****	2,367 (of which 854 is in garage)
	Parking utilization @ 1 PM*****	90%
	Reliance on parking (number of BART spaces per weekday rider)	0.48
	Other parking-related access issues	Pressure on station parking was somewhat reduced when service was extended and Concord was no longer an end-of-the-line station.
Other access modes	Transit****	Station transit access is 9%. Clayton Road and Monument Road corridors are the station's busiest bus lines. County Connections is considering service reductions in the station area. BART, City, and MTC have invested in intermodal improvements at the station.
	Shuttles	Bank of America and other employers have shuttles.
	Pedestrian****	Station pedestrian access is 11%. Seeking better pedestrian access on Oak Street and across Monument from new development.
	Bicycle****	Station bicycle access is 2%. Bicycle access growth potential identified as "medium" and bicycle parking improvement identified as "medium".
BART Plans	Access plan?	No
	Comprehensive Station Plan	No
City Plans		Strategic Plan adopted
Transit Operator Plans		Not known.
Status of development solicitation		City and BART are conducting discussions with developers to assess their interest and the feasibility of development; considering reauthorizing solicitation.

* From station spreadsheet prepared by the Center for Transit Oriented Development, dated 7/29/04
** From station spreadsheet prepared by F&P Associates, dated 8/2/04
*** Tabulations provided by BART staff.
**** From BART Station Profile Study, BART Office of External Affairs, August 1999.
***** From BART Stations-Parking Facility Occupancy Survey, Wilbur Smith Associates, April 20-May 6, 2004, updated by Wilbur Smith for Concord 10/04.

Figure 4 shows the home address of people participating in the reserved parking program. This provides a current assessment of the station's draw among automobile drivers. This distribution does not necessarily represent all drivers to the station, because it captures only those who choose to participate in the reserved parking program.

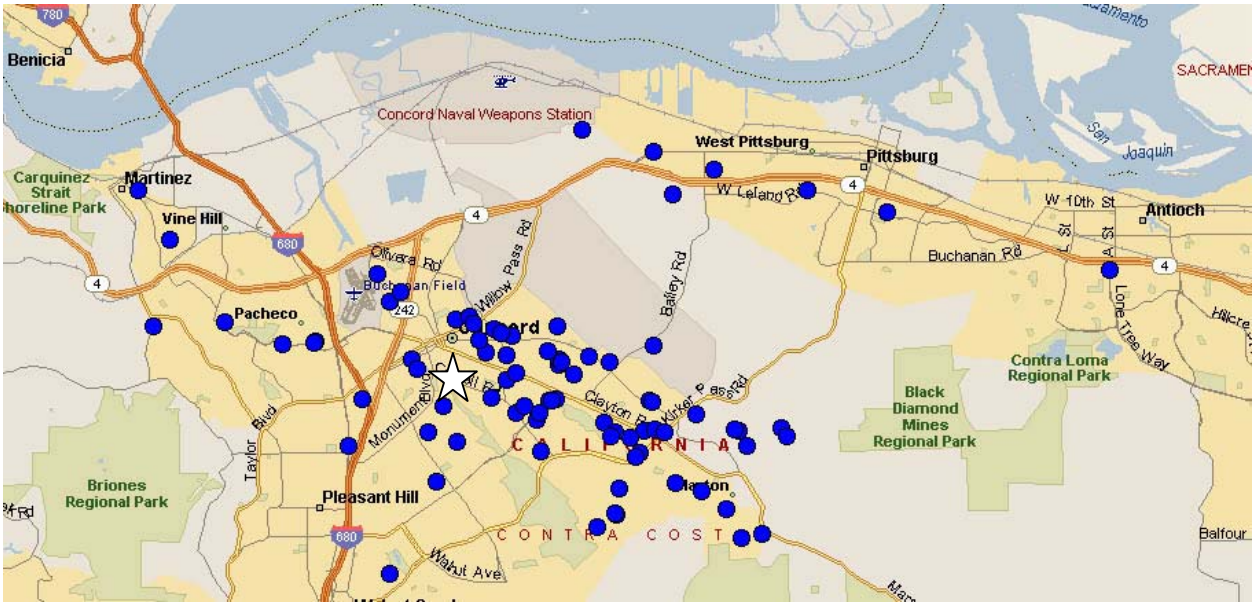

Figure 4. Station Draw for Concord Station (reserved parking participants)

Table 12. Concord Replacement Parking Possibilities

Issue	Status
Is station parking fully utilized?	Monitoring data indicate 90% occupancy as of 10/04. The Mesa Street lot never fills. It is estimated that 229 parking spaces are available. Some of these spaces are more than ¼ mile from the station faregates.
Is nearby, non-BART parking fully utilized?	No known.
Can replacement parking be provided off-site or in shared arrangements?	There are may be opportunities to shift the location of replacement parking between BART parcels, city land, and private development. If properly designed, there are opportunities for shared parking with new residential developments (e.g., visitor spaces are shared).
Can parking demand be shifted to other stations?	North Concord station has capacity (currently 926 spaces are available at 1:00 PM). City officials indicated that roadway capacity improvements would be needed to fully serve station (road through Naval Weapons Base). The cost of the road is estimated at $14 million. City is concerned about North Concord access and spillover at Concord. Trip origins from the 1998 survey indicate that most riders who drive to the Concord station would have to backtrack to park at the North Concord station, which limits the potential of this strategy. Using North Concord also involves extra fare and extra travel time. Planned patron surveys will shed light on the commuting shed of each of these stations.
Are there possibilities for replacement parking funding from other parties (e.g., grant funds, redevelopment)?	Possible use of tax increment funds. No grant funds pending or currently available.
What is the city perspective on deviation from 1:1 replacement parking?	General approach in GP calls for dense, walk-oriented development. City wants to encourage cluster development and increase pedestrian activity. City staff is concerned about spillover parking but is interested in exploring less than 1:1 parking.
What other planning issues exist?	Station area is redevelopment project area. Station has shifted in function from an end-of-the-line station to a mid-line station.
What is the parking management readiness in the station area, i.e., does city and property owners have spillover prevention programs ready (e.g., permits, meters, time limits)?	Parking time limits are used in the downtown area. Parking permit program (permitting four-hour parking without permit) exists in residential areas adjacent to the station. Parking pricing is not used, in on-street or off-street facilities. Parking pricing might be of concern because of competition with areas providing free parking. There might be concerns about parking charges at the BART station, because of spillover issues. When station was the end of the line, spillover parking extended up to one mile from the station.

Taking into account the information provided on Tables 11, 12 and Figure 4, Table 13 presents the top five station policy and context issues, in rank order. This provides a concise summary of the policy and context issues.

Table 13. Top Five Concord Policy and Context Issues

Issue	Relevance to the Access/Replacement Parking
1) Possibilities exist for coordinated development in the station area, with the City and major land owners.	Coordinated parking provision and shared parking are possible if BART and other property owners act in concert. An example is the parcel used by the Police Station, which is adjacent to a long narrow BART surface parking lot. This can provide improvements in land use allocation, urban design, and efficient provision of parking.
2) The Mesa Street parking lot area does not currently fill on a daily basis. Although this lot is not commuters' first choice for parking location, it does represent a parking inventory that could be used if less than full replacement parking occurs.	Parking demand can be shifted from potential BART development sites immediately adjacent to the station to the southern lot.
3) Presence of major employers in station area.	There is a possibility for improved station area shuttle systems. Employer shuttles can also provide accessibility to the community (example Kaiser shuttle at MacArthur).
4) Pedestrian access is good for a suburban station; joint development and adjacent transit-oriented development could increase the pedestrian orientation of the station.	Pedestrian improvements should be a high priority for access improvements, e.g., Oak Street and from new development across Monument (Galindo) Boulevard.
5) There is underutilized parking at North Concord station.	Creates possibility for shifting demand to North Concord through differential pricing. However, many Concord parkers would have to double back to reach North Concord. The city has expressed concerns about the adequacy of roadway access to North Concord.

Scenario Assumptions

The following summarizes the assumptions used in developing three scenarios for development, access and replacement parking. The Avalon Bay development proposal provided an information source for development scenarios, in terms of development intensity and development-provided parking. These assumptions are detailed in Table 14.

- Development site is approximately 7.8 acres on the north/west side of the station, displacing 532 surface parking spaces.
- Scenario A (Conservative): 420 units, all at 1.5 parking spaces per unit. Full replacement parking. No daily parking charges.
- Scenario B (Moderate): 487 units, four story buildings, 370 @ 1 parking space per unit, 117 @ 1.5 parking spaces per unit. 75% replacement parking. Sufficient excess capacity exists in the Mesa lot to accommodate the loss of spaces.
- Scenario C (Aggressive): 615 units, five story buildings, 463 @ 1 parking space per unit, 152 @ 1.5 parking spaces per unit. 50% replacement parking. $1 per day parking charges on 75% of all station parking spaces, existing reserved parking program continues, $50,000 annual contribution to shuttle bus partnership, and a one-half million dollar BART contribution to pedestrian improvements in the station area. Sufficient excess capacity exists in the Mesa lot to accommodate 229 of the 266 lost spaces. Scenario C creates an effective loss of 37 spaces.
- All scenarios assume 5,000 square feet of retail without any dedicated parking.

Table 14. Concord Station Joint Development and Access/Replacement Parking Scenarios

	Existing Condition	Scenario A: Conservative, 100% replacement	Scenario B: Moderate, 75% replacement, use existing unused parking	Scenario C: Aggressive, 50% replacement, use existing unused parking, ped., shuttle improvements
# units residential (rental)	0	420	487	615
Retail (sf)	0	5,000	5,000	5,000
# of BART parking spaces provided on development site	532	532	399	266
Parking spaces for joint development		630	546	691
BART parking spaces shared with the joint development		0	0	50
Total non-shared spaces built (BART + joint development)		1,162	945	957
Parking charges on the BART parking	$0, $42/mo. on 29 reserved	$0, $42/mo. on 29 reserved	$0, $42/mo. on 29 reserved	$42/mo. on 29 reserved; $1/ day on 1,576 BART spaces
New transit/shuttle programs		None	None	BART contributes $50,000 per year to shuttle consortium.
New walk/bike programs		None	None	Ped. linkages to Monument Blvd. BART provides $0.5 million in partnership
New on-street parking management programs (e.g., permit or time limits)		None	None	Expand permit parking program to prevent spillover
Economic issues		Full replacement parking may require all ground lease revenue and a portion of tax increment.	Developer saves $1.99 million in parking construction @ $15k per space. More units increase potential ground rent.	Developer saves $3.99 m. in parking construction @ $15k per space. Even more units increase potential ground rent.
Local barriers to TOD and how they are addressed				Improved financial performance of project.

Table 15 summarizes the ridership impacts of the three scenarios. No ridership impact is predicted from not fully replacing parking in Scenarios B because unused spaces in the Mesa street southern BART lot are available for those displaced by the joint development. Scenario C is almost the same.

Scenarios A and B show ridership gains that are associated with the transit trips from the joint development. Scenario C shows a parking-related ridership decrease because of $1 per day parking charge on 75% of the spaces, but overall there is a ridership gain because of the joint development. This parking-related ridership loss occurs because the current parking lot is not full, meaning that they are not likely latent replacements for any rider discouraged by the introduction of parking charges.

Table 15. Concord Joint Development Ridership Impact

	Scenario A	**Scenario B**	**Scenario C**
Weekday riders associated with joint development	478	551	691
Change in weekday riders associated with BART parking and access	0	0	(172)
Net impact on BART boardings	478	551	519
Reduction in drive alone share	Least	Middle	Most

Table 16 summarizes the fiscal impacts of the three scenarios.

Table 16. Concord Fiscal Checklist (change from existing condition)

		Scenario A	Scenario B	Scenario C
Annual **revenue** factors…	Fares from net change in riders	$423,721	$488,889	$460,368
	Parking charges (net)	$0	$0	$251,923
	Ground rent associated with change in replacement parking[8]	$136,362	$335,862	$535,362
	Annualized value of external grant/partnership support	$0	$0	$0
Annual **cost** factors…	BART parking operating costs (maint., security,)[9]	($98,197)	($26,693)	$44,810
	New operating costs for BART service	$0	$0	$0
	BART part. in operating costs for new access modes	$0	$0	($50,000)
	BART part. in access capital improvements (annualized)	$0	$0	($50,000)
Net annual impact (sum of revenues and costs)		**$461,886**	**$798,058**	**$1,192,463**

Table 17 shows the summary results of the three scenarios. All three show positive outcomes as compared to the status quo. The availability of spaces in the Mesa lot makes all scenarios attractive. Scenarios A and B produce more ridership, significant revenue gains for BART, a shift toward non-auto access, and fit well with the plans of BART, local cities and regional entities. Scenario C produces the highest annual revenue to BART--$1,192,463. Note that the analysis does not fully represent the difference in ground rent across the three scenarios. The greater development intensity of Scenario C would produce a higher net operating income, which when capitalized, would provide greater ground rent. In that respect the estimates for Scenario C are conservative. Detailed market feasibility and pro forma analyses are needed to more accurately forecast ground rent.

[8] This is ground rent associated with changes in parking requirements only. It does not reflect additional ground rent associated with the higher development intensities of some scenarios or other forms of revenue participation.
[9] Scenarios B and C show a positive cash flow for parking operating costs because the reduced parking supply saves BART the annual operating costs for those spaces.

Table 17: Concord Summary Evaluation Matrix

Criteria	**Scenario A**	**Scenario B**	**Scenario C**
Ridership: net annual ridership impact (from Table 15)	478	551	519
Revenues and costs: net annual impact, $/year (from Table 16)	$461,886	$798,058	$1,192,463
Station access mode: **reduction in drive alone share** (from Table 15)	Least	Middle	Most
Long-term BART capacity	Retains land in surface parking, which provides flexibility in the future. Stakeholders concerned about future bus service.	Retains land in surface parking, which provides flexibility in the future. Stakeholders concerned about future bus service.	Retains land in surface parking, which provides flexibility in the future. Stakeholders concerned about future bus service.
BART Plans: support Comprehensive Station Plans, access targets, joint development goals.	No CSP or Access plan for this station.	No CSP or Access plan for this station.	No CSP or Access plan for this station.
Local goals: Context-appropriate and well-designed; local support, partnerships, reduce TOD barriers (qualitative).	Supports city objectives.	Supports city objectives.	Supports city objectives. City may have concern with spillover parking, but low $1 parking fee reduces spillover potential.
Regional goals: e.g., provision of housing, housing affordability, congestion, air quality, etc. (qualitative)	Least support for non-auto modes, but continues regional park and ride function.	Balanced between scenarios A and C	Most support for TOD transition.

Del Norte Case Study

Overview

The Del Norte station is located in the City of El Cerrito, second from the end-of-the-line of the R line. Because of its relationship to freeways, however, the station functions in part as an end-of-the-line station. Figure 5 shows the context of the Del Norte station.

Joint development at the Del Norte station has been hampered by the economic effects of a requirement for underground replacement parking and limits on the density permitted for joint development. The community view is split on the transit station and joint development—some people do not like the area being a transit hub while others think that city improvement can be focused at the station. The more promising joint development scenarios involve a relocation of part of BART parking across San Pablo Avenue, but parcel availability is uncertain.

Figure 5. Del Norte Station Context

The Del Norte station configuration is shown on Figure 6 below. Tables 18 and 19 summarize station context, access, and replacement parking circumstances.

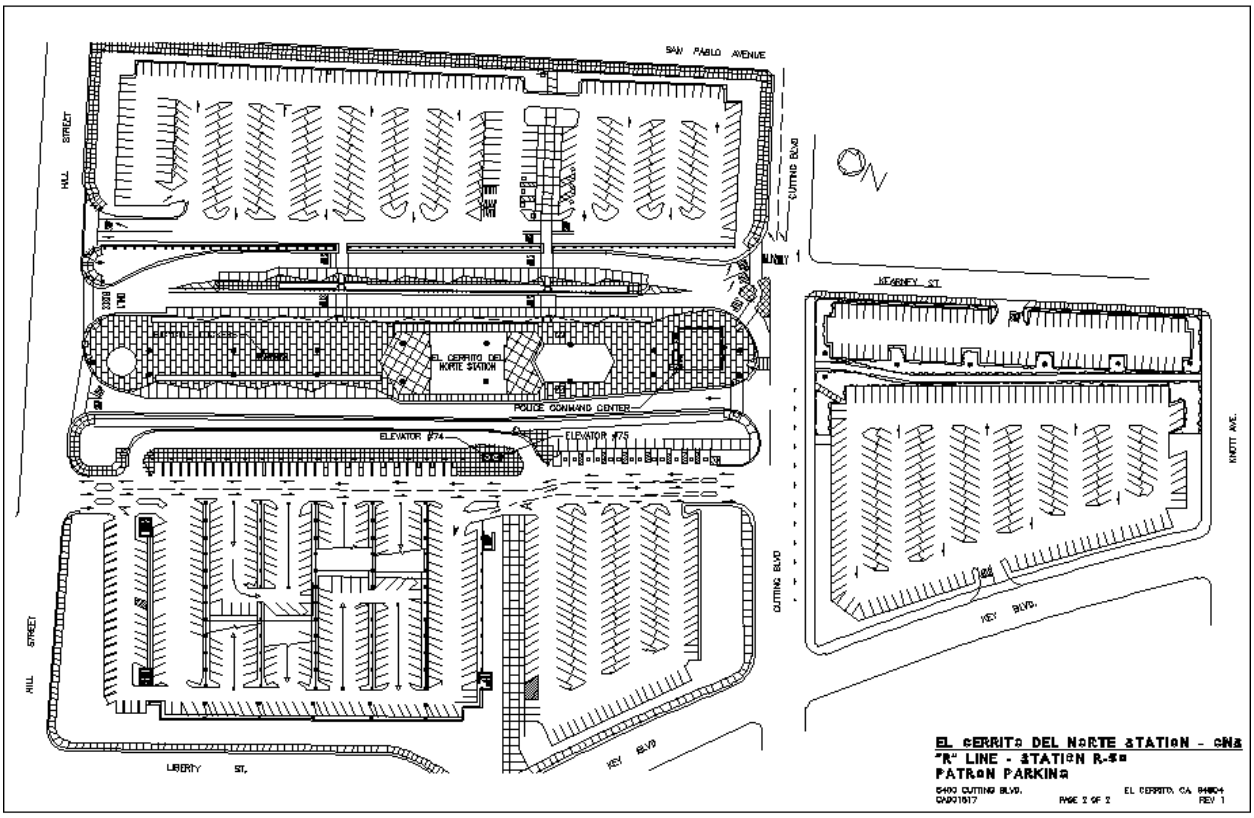

Figure 6. Del Norte Station

Table 18. Del Norte Station Context

Category	Characteristic	Condition
Station characteristics	Station type*	Urban neighborhood
	Transportation function	Origin
	Station weekday ridership '04 (exits)**	7,258
	Average weekday round trip fare paid from station***	$5.44
	Weighted average service density***	14 trains per hour
	Station draw	A two mile radius around the station, plus a corridor along the I-80, through Hercules and Vallejo.
Station area characteristics	Population w/in ½ mile**	6,206
	Employment w/in ½ mile**	1,771
Parking	BART parking*****	2,198, 1,300 of which are in a garage
	Parking utilization @ 1 PM*****	100%
	Reliance on parking (number of BART spaces per weekday rider)	0.31
	Other parking-related access issues	Serves as de facto terminus of the Richmond Line.
Other access modes	Transit****	Station transit access is 27%. Served by AC Transit, Golden Gate Transit, WestCAT, and Vallejo Transit. Enhanced express/shuttle service on I-80 corridor could alter access modes. Would benefit from improved bus service in neighborhoods east of the station and improved intermodal functioning.
	Shuttles	Not a lot of shuttle services.
	Pedestrian****	Station pedestrian access is 12%. Quality of access rated as poor in CSP, except for Ohlone Greenway, a north-south bicycle and pedestrian way. San Pablo Avenue is a barrier. City recently completed a pedestrian, bicycle, and disabled persons access plan.
	Bicycle****	Station bicycle access is 1%. 28 bicycle lockers and 128 racks. Bicycle access growth potential identified as "medium" and bicycle parking improvement identified as "medium".
Additional data sources	Real estate feasibility	Sedway Group analysis of replacement parking feasibility for joint developments.
BART Plans	Access plan?	Yes.
	Comprehensive Station Plan	Yes.
City Plans		Update Design Guidelines adopted, Development concept created. City will be considering zoning code revisions that may change parking requirements, density, and height limits in the station area.
Transit Operator Plans		Not known.
Status of development solicitation		New solicitation anticipated in the future.

* From station spreadsheet prepared by the Center for Transit Oriented Development, dated 7/29/04
** From station spreadsheet prepared by F&P Associates, dated 8/2/04
*** Tabulations provided by BART staff.
**** From BART Station Profile Study, BART Office of External Affairs, August 1999.
***** From BART Stations-Parking Facility Occupancy Survey, Wilbur Smith Associates, April 20-May 6, 2004.

Figure 7 shows the home address of people participating in the reserved parking program. This provides a current assessment of the station's draw among automobile drivers. This distribution does not necessarily represent all drivers to the station, because it captures only those who choose to participate in the reserved parking program.

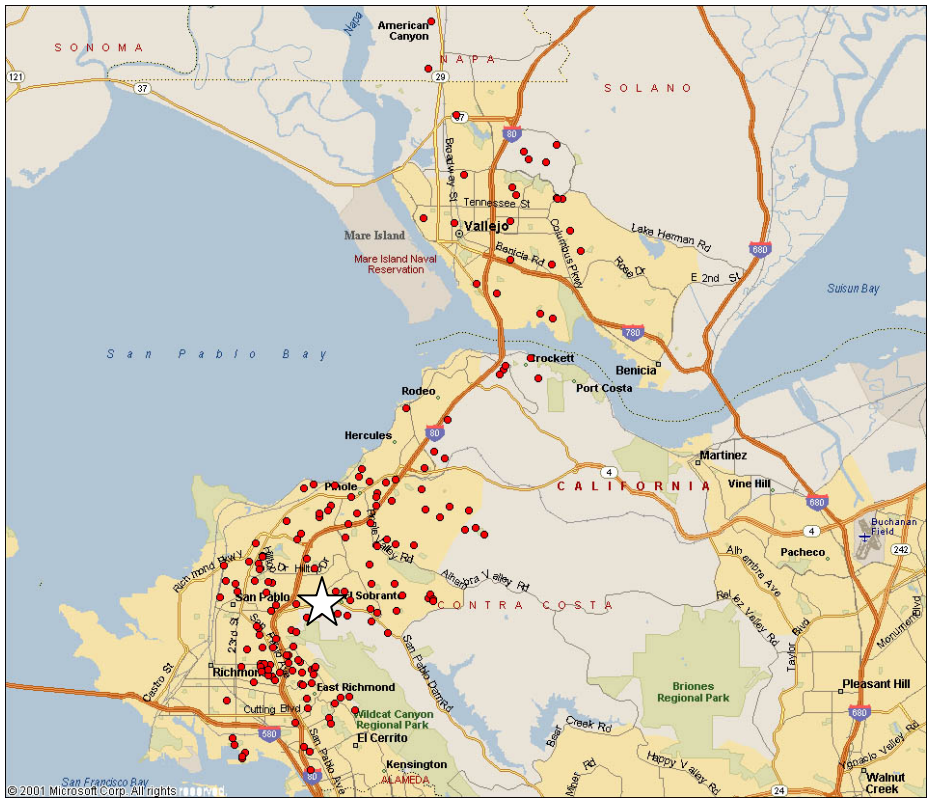

Figure 7. Station Draw for Del Norte Station (reserved parking participants)

Table 19. Del Norte Replacement Parking Possibilities

Issue	Status
Is station parking fully utilized?	Monitoring data indicate 100% full at 1:00 pm.
Is nearby, non-BART parking fully utilized?	No, adjacent paid parking lot not fully occupied.
Can replacement parking be provided off-site or in shared arrangements?	Developer proposals indicate that 1:1 replacement parking makes joint developments infeasible, even if BART contributes all ground rent and the city contributes tax increment. Previous development solicitation was not successful. Developer initially wanted replacement of parking in underground facilities, which adds cost. Underground parking is complicated by high water table and bedrock. Relocation of BART parking examined during developer's most recent development proposal and adopted by the City in Design Guideline Update study. Off-site location encumbered by revenue-generating lease in favor of the property owner.
Can parking demand be shifted to other stations?	Proposal has merits but land may be difficult to acquire. Richmond is unlikely because of relationship to freeways and access patterns. Commuters could continue on to El Cerrito Plaza, but that would increase local traffic impacts.
Are there possibilities for replacement parking funding from other parties (e.g., grant funds, redevelopment)?	Measure C funds may be available to improve parking or transit improvements in the station area. Tax increment funds could be available
What is city perspective on deviation from 1:1 replacement parking?	Willing to consider if makes joint development possible. City asked BART to consider less than 1:1 replacement.
What other planning issues exist?	Density and height limits are restrictive; station area is redevelopment project area. BART is asking for increase in density and removal of height restriction.
What is the parking management readiness in the station area, i.e., does the city and property owners have spillover prevention programs ready (e.g., permits, meters, time limits)?	Permit parking programs are effectively controlling spillover. El Cerrito Plaza station lost 1,000 informal spaces when mall construction occurred with very little negative impact because of the effectiveness of those programs.

Taking into account the information provided on Tables 18, 19 and Figure 7, Table 20 presents the top five station policy and context issues, in rank order. This provides a concise summary of the policy and context issues.

Table 20. Top Five Del Norte Policy and Context Issues

Issue	Relevance to the Access/Replacement Parking
1) Balance between facilitating mixed-use station area development and ensuring sufficient park-and-ride capacity to serve the station's large commuter shed.	The station functions as an end-of-the-line station for many commuters, and this role will likely continue in the future.
2) Restrictions on density can undermine financial feasibility of development.	BART wants to ensure that joint development is of sufficient density and generates positive returns.
3) Spillover parking is well managed.	Pricing strategies can be implemented with less concern about spillover issues.
4) Underground replacement parking is prohibitively expensive and difficult from an engineering standpoint.	Relocating replacement parking across San Pablo Avenue provides economies. However, the land is encumbered with lease revenues in favor of property owner.
5) Commuting market seems well-suited for commuter bus and shuttle services.	Improvements in bus and shuttle access from outlying communities could reduce demand on station parking. Key asset is the HOV lane on the I-80 corridor and priority off-ramp in the station area. Questions exist about future bus service.

Assumptions

The Del Norte scenarios (shown on Table 21) are based on the following assumptions.

- All scenarios replace BART parking in a structure across San Pablo Avenue. The cost per structured space ($17,500) includes land acquisition costs. All scenarios also include a $500,000 capital contribution to pedestrian improvements on San Pablo Avenue.
- Scenarios A and B (Conservative): 462 units (270 @ 1.25 parking spaces per unit, 62 @ 2.0 parking spaces per unit, and 130 @ 1.75 parking spaces per unit). This project includes 270 rental units @ 84 units per acre and 192 for-sale @ 30 units per acre. Scenario A involves 100% parking replacement and Scenario B involves 75% parking replacement. Scenario B has a $1 daily parking charge on 50% of spaces, with the existing reserved parking program continuing.
- Scenario C (Moderate): 624 units with 1.5 spaces per unit. Involves modification of city density cap to permit 65 units per acre. 50% replacement parking. Scenario C has a $1 daily parking charge on 75% of spaces, with the existing reserved parking program continuing.
- All scenarios assume 20,000 square foot retail, parked at 3 parking spaces per 1,000 square feet.

Table 21. Del Norte Station Scenarios

	Existing Condition	Scenario A: Conservative, full replacement off BART site	Scenario B: Conservative, 75% rep. off-site, shared parking, parking charges	Scenario C: Moderate 50% replacement off-site, shared parking, parking charges
# units residential (rental)	0	270	270	624
# units for sale housing	0	192	192	0
Retail (sf)	0	20,000	20,000	20,000
# of BART parking spaces on site	898	0	0	0
Off-site replacement of BART spaces (in station area)		898	674	449
Parking spaces for joint development		749	749	996
BART parking spaces shared with the joint development			100	100
Total development spaces (BART replacement + joint development, not counting shared spaces)		1,647	1,423	1,445
Parking charges on the BART parking	$0, $42 per month on 111 reserved	$0, $42 per month on 111 reserved	$42 per month on 111 reserved; $1 per day on 1,009 BART spaces	$42 per month on 111 reserved; $1 per day on 1,648 BART spaces
New transit/shuttle programs		Study demand patterns for added service	Study demand patterns for added service	Study demand patterns for added service
Other access improvements		Shift of parking to west side of San Pablo requires reconfiguration of San Pablo. Assumes $500k BART contribution	Shift of parking to west side of San Pablo requires reconfiguration of San Pablo. Assumes $500k BART contribution	Shift of parking to west side of San Pablo requires reconfiguration of San Pablo. Assumes $500k BART contribution
Economic issues		Sedway analysis concludes that this alternative is not feasible	Saves developer $3.9 million @ $17.5k per spaces.	Saves developer $7.9 million if one site reduction is $17.5k per space.
Local barriers to TOD and how they are addressed		High on-site parking costs.	High on-site parking costs.	High on-site parking costs, Density limits.

Table 22 summarizes the ridership impacts of the three scenarios. Scenarios A and B show ridership gains that are associated with the transit trips from the joint development. Scenario C shows the smallest ridership gain.

Table 22. Del Norte Weekday Ridership Impact Summary

	Scenario A	**Scenario B**	**Scenario C**
Ridership impact of joint development	644	644	821
Ridership impact of change in BART parking supply	0	(301)	(603)
Ridership impact of parking charge programs	0	0	0
Ridership of other access programs	0	0	0
Net impact on BART boardings	644	343	219
Reduction in drive alone share	Least	Middle	Most

Table 23 summarizes the fiscal impacts of the three scenarios.

Table 23. Del Norte Fiscal Checklist (change from existing condition)

		Scenario A	**Scenario B**	**Scenario C**
Annual **revenue** factors	Fares from net change in riders	$466,397	$248,574	$158,485
	Parking charges (net)	$0	$175,703	$263,474
	Ground rent associated with change in replacement parking (assuming $30/sf)[10]	($418,472)	($222)	$418,028
	Annualized value of external grant/partnership support	$0	$0	$0
Annual **cost** factors	BART parking operating costs (maint., security,)	($165,753)	($45,326)	$75,639
	New operating costs for BART service	$0	$0	$0
	BART part. in operating costs for new access modes	$0	$0	$0
	BART part. in access capital improvements (annualized)	($50,000)	($50,000)	($50,000)
Net annual impact (sum of revenues and costs)		**($167,828)**	**$328,729**	**$865,626**

Table 24 shows the summary results of the three scenarios. The scenarios show the variety of tradeoff in seeking improvement beyond the status quo. Scenario A produces the most ridership but a net negative fiscal impact. Scenario C produces a modest ridership gain and the highest

[10] Note: this is ground rent associated with changes in parking requirements only. It does not reflect additional ground rent associated with the higher development intensities of some scenarios or other forms of revenue participation.

annual revenue to BART--$865,626. One of the areas of greatest need for additional information is the prospects for future bus service to the station. The scenarios that involve the larger reductions in BART station parking are more vulnerable to service reductions and/or a lack of increases in bus service. Higher parking charges than tested here could fund other access programs, such as improved bus access along the I-80 corridor.

Table 24: Del Norte Summary Evaluation Matrix

Criteria	**Scenario A**	**Scenario B**	**Scenario C**
Ridership: net annual ridership impact (from Table 22)	644	343	219
Revenues and costs: net annual impact, $/year (from Table 23)	($167,828)	$328,729	$865,626
Station access mode: **reduction in drive alone share** (from Table 22)	Least	Middle	Most
Long-term BART capacity	Reduces land available for future parking, if needed.	Reduces land available for future parking, if needed. Reliant on bus transit providers offering additional service.	Reduces land available for future parking, if needed. Most reliant on bus transit providers offering additional service.
BART Plans: support Comprehensive Station Plans and access targets.	Maintains support for station's role as a commuter-oriented "end of the line" station. Concern about low density of housing.	Balances BART objectives to serve commuters and support development of a mixed use center. Concern about low density of housing.	Support the evolution of the station area toward a mixed use center, and transition to non-auto access.
Local goals: Context-appropriate and well-designed; local support, partnerships, reduce TOD barriers (qualitative).	Supports city objectives. Might have greatest community acceptance, because full replacement occurs.	Supports city objectives.	Appears to most strongly support the direction city policy is taking, although requires changes in permitted density.
Regional goals: e.g., provision of housing, housing affordability, congestion, air quality, etc. (qualitative)	Least support for non-auto modes, but continues regional park-and-ride function.	Offers a balance between Scenarios A and C.	Most support for TOD transition, but least support for regional-park-and ride function.

MacArthur Case Study

Overview

MacArthur is a centrally located station on the K line in the City of Oakland. Resolving access/replacement parking issues is urgent at the MacArthur station because a developer has been selected for a joint development project. This station is the most urban setting of those being tested, with a relatively low level of existing BART parking and high levels of use of alternative access modes. Community views on replacement parking are mixed. Figure 8 shows the surface parking lot that comprises a large part of the joint development site.

Figure 8. MacArthur Joint Development Site

There are possibilities for shifting MacArthur's parking demand to new facilities at the West Oakland station, but adding parking in that area would likely be opposed by the local community. The methodology can be used to analyze such a scenario, but a scenario that relocates parking is not included in this analysis. It should also be noted that MacArthur Transit Community Partners LLC (MTCP), the developer of the site, has not suggested or endorsed the features of the scenarios.

A site plan of the MacArthur station configuration and parking is shown in Figure 9 that follows. Tables 25 and 26 and Figure 10 summarize station context, access, and replacement parking circumstances. Note that the total development concept encompasses about 10 acres, which includes some privately-owned parcels that will need to be acquired for the project. However, the financial analysis presented here is based on an assumed parcel size of 259, 200 square feet, the area of the BART surface parking lot.

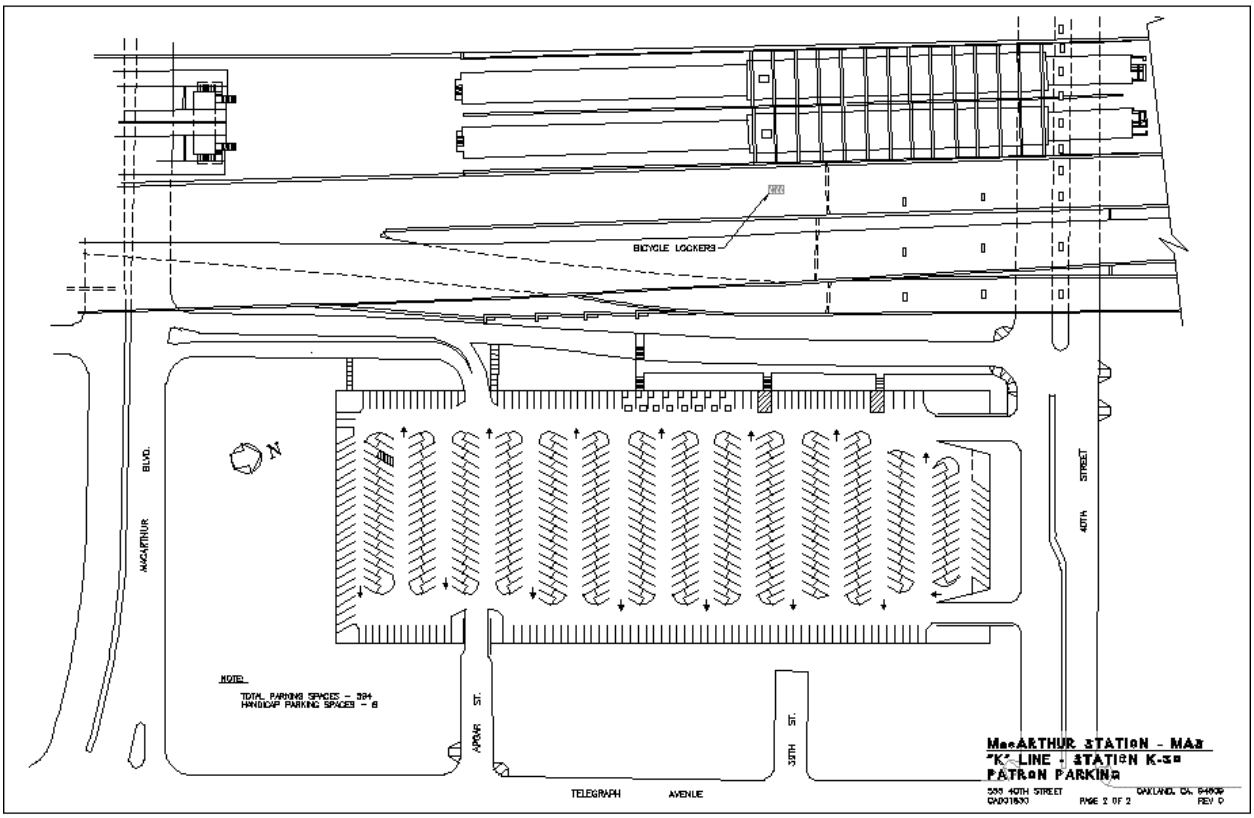

Figure 9. MacArthur Station

Table 25. MacArthur Station Context

Category	Characteristic	Condition
Station characteristics	Station type*	Urban neighborhood
	Transportation function	Origin and destination
	Station weekday ridership '04 (exits)**	6,028
	Average weekday round trip fare paid from station***	$4.86
	Weighted average service density***	23 trains per hour
	Station draw****	Generally within a one mile radius of the station, with a bias to the southeast along the 580 corridor
Station area characteristics	Population w/in ½ mile**	9,531
	Employment w/in ½ mile**	5,619
Parking and access	BART parking****	603
	Parking utilization @ 1 PM*****	100%
	Reliance on parking (number of BART spaces per weekday rider)	0.10
	Other parking-related access issues	Private parking providers at West Oakland charge $6 per day, indicating strong market demand. However, West Oakland station serves a broader commuter shed, has greater train frequency, etc.
Other access modes	Transit****	Station transit access is 20%. Proposals for BRT may affect site design and access.
	Shuttles	Emeryville and Emery-Go-Round travel will increase over time (BID funded shuttle system). Employer-provided shuttles are used (e.g., from medical cluster)
	Pedestrian****	Station walk access is 27%. Crime issues exist for pedestrians. Pedestrian improvements are underway on 40th Street
	Carpooling	Developer reports that casual carpooling in the neighborhoods around that station creates parking demand in those neighborhoods.
	Bicycle****	Station bicycle access is 4%. BART Bicycle plan rates station as having "high" bicycle access growth potential and "high" priority for bicycle parking improvements.
Data sources	Trip origins of those using MacArthur station	Developer may fund intercept survey.
BART Plans	Access Plan?	Scheduled for completion by June 2005.
	Comprehensive Station Plan?	Scheduled for completion by June 2005.
City Plans		Redevelopment Plan adopted.
Transit Operator Plans		Not known.
Status of development solicitation		Developer negotiations underway.

* From station spreadsheet prepared by the Center for Transit Oriented Development, dated 7/29/04
** From station spreadsheet prepared by F&P Associates, dated 8/2/04
*** Tabulations provided by BART staff.
**** From BART Station Profile Study, BART Office of External Affairs, August 1999.
***** From BART Stations-Parking Facility Occupancy Survey, Wilbur Smith Associates, April 20-May 6, 2004.

Figure 10 shows the home address of people participating in the reserved parking program. This provides a current assessment of the station's draw among automobile drivers. This distribution does not necessarily represent all drivers to the station because it captures only those who choose to participate in the reserved parking program.

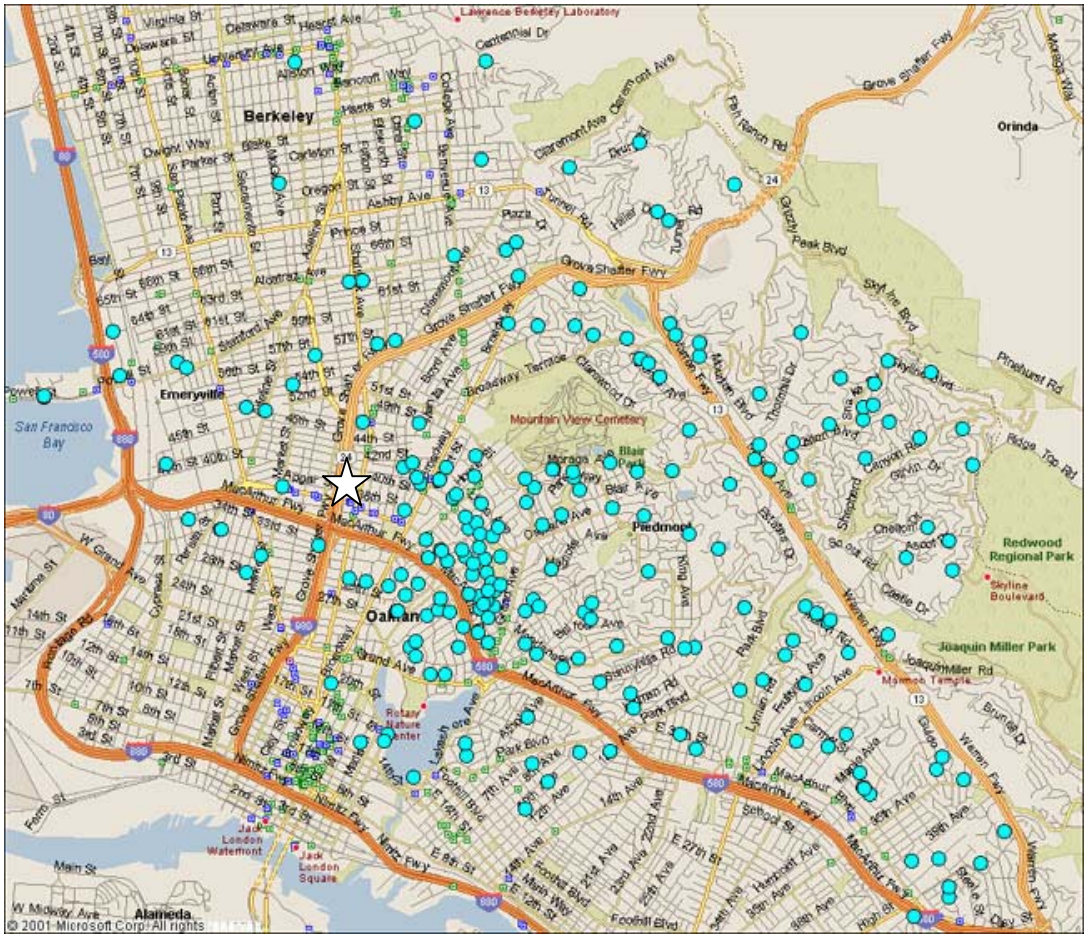

Figure 10. Station Draw for MacArthur Station (reserved parking participants)

Table 26. MacArthur Replacement Parking Possibilities

Issue	Status
Is station parking fully utilized?	Monitoring data indicate 100% full at 1:00 pm.
Is nearby, non-BART parking fully utilized?	Yes.
Can replacement parking be provided off-site or in shared arrangements?	Possible shared use in joint development – grocery store
Can parking demand be shifted to other stations?	Technically possible in the West Oakland station area, but there would be community resistance to moving parking there. West Oakland has a greater train frequency and better freeway access.
Are there possibilities for replacement parking funding from other parties (e.g., grant funds, redevelopment)?	May be CMA funds in the future.
What is city perspective on deviation from 1:1 replacement parking?	City would consider. City has well developed community participation tradition. The community is split between requiring replacement and moving away from BART station area parking.
What other planning issues exist?	Community preferences vary, but the general preference is for residentially-oriented development with neighborhood serving retail.
What is the parking management readiness in the station area, i.e., does the city and property owners have spillover prevention programs ready (e.g., permits, meters, time limits)?	Spillover is occurring (on-street parking on MacArthur, Martin Luther King and 40th Street). Some neighbors are complaining about spillover; city is prepared to institute a permit system.

Taking all these context issues together, Table 27 summarizes the top five policy and context issues.

Table 27. Top Five MacArthur Policy and Context Issues

Issue	Relevance to the Access/Replacement Parking
1) Station has an urban context and low dependency on parking for ridership.	Potential ridership loss associated with non-replacement of parking is less than suburban stations.
2) Joint development proposal has a wider variety of land uses than other stations.	Increases potential for shared parking between joint development uses and between the joint development and BART.
3) Community sentiment on replacement parking is mixed, with some community members seeking more BART parking and others wanting to decrease BART parking.	Community processes will need to engage the community in discussions about which vision for the station is desired.
4) Station has the highest walk share of the cases studied, despite a location in the middle of an elevated freeway and station visibility issues.	Station has potential for more walk access as pedestrian improvements are provided and joint development and station area development produces more walk trips.
5) The West Oakland station provides a more attractive auto intercept point than the MacArthur station.	Potential for replacing some MacArthur parking at West Oakland exists, but would require community buy-in.

Assumptions

The following assumptions have been made in developing the MacArthur scenarios. They are detailed in Table 28.

- BART development parcel size is 259,200 square feet.
- Scenarios A and B (conservative): 575 units @ 1.125 parking spaces per unit, 41,000 square feet of retail @ 4 parking spaces per 1,000 square feet, 14,000 square feet of medical uses @ 3 parking spaces per 1,000 square feet, and 4,500 square feet of community facilities with no parking. Scenario A has 100% replacement parking and Scenario B has 50% replacement parking.[11] Scenario B has a $1 per day parking charge on 50% of the spaces; existing reserved parking program continues.
- Scenario C (aggressive): 650 units @ 1.125 parking spaces per unit, 103,000 square feet of retail @ 4 parking spaces per 1,000 square feet, 60,000 square feet of medical @ 3 parking spaces per 1,000 square feet, and 6,000 square feet of community facilities with no parking. Scenario C has 50% replacement parking.[12] Those spaces are offered at $3 per day, replacing the reserved parking program. Scenario C assumes that a $180,000 per year matching fund is offered by BART to stimulate additional private shuttle or AC Transit service. This number is based on a 25% reduction in Emery-Go-Round headways at $60 per vehicle hour. The scenario also includes a $1 million contribution to a relocation of the bus transfer facility.

[11] Note that if replacement parking was decreased by 50%, the developer may be able to increase the density of neighborhood supporting and income producing uses in the project, potentially increasing riders, revenue, taxes, etc. The scenario shown here is conservative in that it does not reflect those potential additional revenues. Further negotiation between the developer, the City and BART would be required to determine what, if any, density increase would be allowed, and more detailed market feasibility and pro form analysis would be needed to estimate additional revenue.

[12] Same as previous footnote.

Table 28. MacArthur Station Scenario Working Assumptions

	Existing Condition	Scenario A: Conservative, full replacement	Scenario B: Conservative, 50% on-site replacement, shared parking	Scenario C: Aggressive, 50% on-site replacement, , shared parking, access imp.
# units residential (rental)	0	287	287	325
# units for sale housing	0	288	288	325
Retail (sf)	0	41,000	41,000	103,000
Medical office (sf)		14,000	14,000	60,000
Community (sf)		4,500	4,500	6,000
# of BART parking spaces on-site	603	603	302	302
Parking spaces for joint development		853	853	1,323
BART parking spaces shared with the joint development		0	100	200
Total non-shared spaces (BART + joint dev.—Scen. C includes W. Oakland)		1,456	1,155	1,625
Parking charges on the BART parking at station	$0, $63 per month on 119 reserved	$0, $63 per month on 119 reserved	$63 per month on 119 reserved; $1 per day on 151 spaces	$3 per day at on all spaces
New transit/shuttle programs		None	None	Relocated bus transfer facility. Improved AC Transit or private shuttle service.
New walk/bike programs		Site design provides a new diagonal pedestrian access to station and better station visibility	Site design provides a new diagonal pedestrian access to station and better station visibility	Site design provides a new diagonal pedestrian access to station and better station visibility
Economic issues			Would save the developer $4.5 million if parking costs are $15k per space.	Would save the developer $4.5 million if parking costs $15k per space.
Local barriers to TOD and how they are addressed		Improves pedestrian access.	Improves pedestrian access.	Improves pedestrian access.

Table 29 summarizes the ridership impacts of the three scenarios. Scenario A shows robust increases in ridership, with Scenario B showing a smaller increase because of 50% replacement of BART parking. Scenario C shows the largest increase because the larger joint development compensates for the loss of riders associated with 50% parking replacement.

Table 29. MacArthur Weekday Ridership Impact Summary

	Scenario A	**Scenario B**	**Scenario C**
Ridership impact of joint development	962	962	1,636
Ridership impact of change in BART parking supply	0	-324	-324
Ridership impact of parking charge programs	0	0	0
Ridership of other access programs	0	0	100
Net impact on BART boardings	962	638	1,411
Reduction in drive alone share	Least	Middle	Most

Table 30 summarizes the fiscal impacts of the three scenarios. Scenario C generates roughly twice the net annual revenue for BART than Scenario A, despite that fact that BART provides $180,000 in annual operating assistance to bus/shuttle systems and a $1 million capital contribution toward a redesigned bus facility. Also note that Scenario A involves a negative ground rent, indicating that full allocation of all ground rent is not sufficient to pay for the cost of replacement parking.

Table 30. MacArthur Fiscal Checklist

		Scenario A	Scenario B	Scenario C
Annual **revenue** factors	Fares from net change in riders	$622,810	$412,759	$913,448
	Parking charges (net)	$0	$24,141	$77,243
	Ground rent associated with change in replacement parking (assuming $30/sf)[13]	($126,900)	$326,100	$326,100
	Annualized value of external grant/partnership support	$0	$0	$0
Annual **cost** factors	BART parking operating costs (maint., security,)	($111,302)	$50,522	$50,522
	New operating costs for BART service	$0	$0	$0
	BART part. in operating costs for new access modes	$0	$0	($180,000)
	BART part. in access capital improvements (annualized)	$0	$0	($100,000)
Net annual impact (sum of revenues and costs)		**$384,609**	**$813,552**	**$1,087,313**

Table 31 shows the summary results of the three scenarios. All three show positive outcomes as compared to the status quo. Scenario A produces an estimated negative ground rent, but the overall fiscal impact is positive because the increased fare revenue more than overcomes the negative ground rent. Scenario B produces a more positive fiscal outcome, although ridership gain is the smallest of the three scenarios. Scenario C shows the potential of higher parking charges, other access improvements, and aggressive development plans in producing the greatest overall benefits in terms of ridership, revenues, and urban planning outcomes.

[13] Note: this is ground rent associated with changes in parking requirements only. It does not reflect additional ground rent associated with the higher development intensities of some scenarios or other forms of revenue participation.

Table 31: MacArthur Summary Evaluation Matrix[14]

Criteria	**Scenario A**	**Scenario B**	**Scenario C**
Ridership: net annual ridership impact (from Table 29)	962	638	1,411
Revenues and costs: net annual impact, $/year (from Table 30)	**$384,609**	**$813,552**	**$1,087,313**
Station access mode: **reduction in drive alone share** (from Table 29)	Least	Middle	Most
Long-term BART capacity	No land left at station for future BART use.	No land left at station for future BART use.	No land left at station for future BART use.
BART Plans: support Comprehensive Station Plans and access targets.	Mixed-use nature of project provides broad ridership base.	Mixed-use nature of project provides broad ridership base.	Supports the evolution toward a mixed use center and transition to non-auto access.
Local goals: Context-appropriate and well-designed; local support, partnerships, reduce TOD barriers (qualitative).	Supports city objectives.	Supports city objectives.	Supports city objectives, although requires agreement with West Oakland neighborhood.
Regional goals: e.g., provision of housing, housing affordability, congestion, air quality, etc. (qualitative)	Least support for non-auto modes, but still creates mixed-used TOD.	Balanced between scenarios A and C.	Most support for TOD transition.

[14] Per previous footnote 11, the ridership and revenue could be greater if development intensity is increased further in response to lower replacement parking requirement.

San Leandro Case Study

Overview

The San Leandro station is a mid-corridor station on the A line, in the City of San Leandro. There are a wide variety of joint development options for San Leandro that depend on the scale of the development and the participation of other property owners. The city is seeking the revitalization of Central San Leandro through its Strategic Plan. The community is concerned about spillover parking and the level and type of growth. Figure 11 shows the surface parking lot being considered for joint development.

Figure 11. BART Surface Parking Lot

BART has authorization to release an RFP. In the absence of an agreement on a larger development program and partnership structure, the scenario used for testing is a modest project involving the 2.2 acre BART parking lot on the east side of San Leandro Boulevard. Figures 12 and 13 show the BART station and parking area—the development site in question is the rectangular lot at the top of Figure 12.

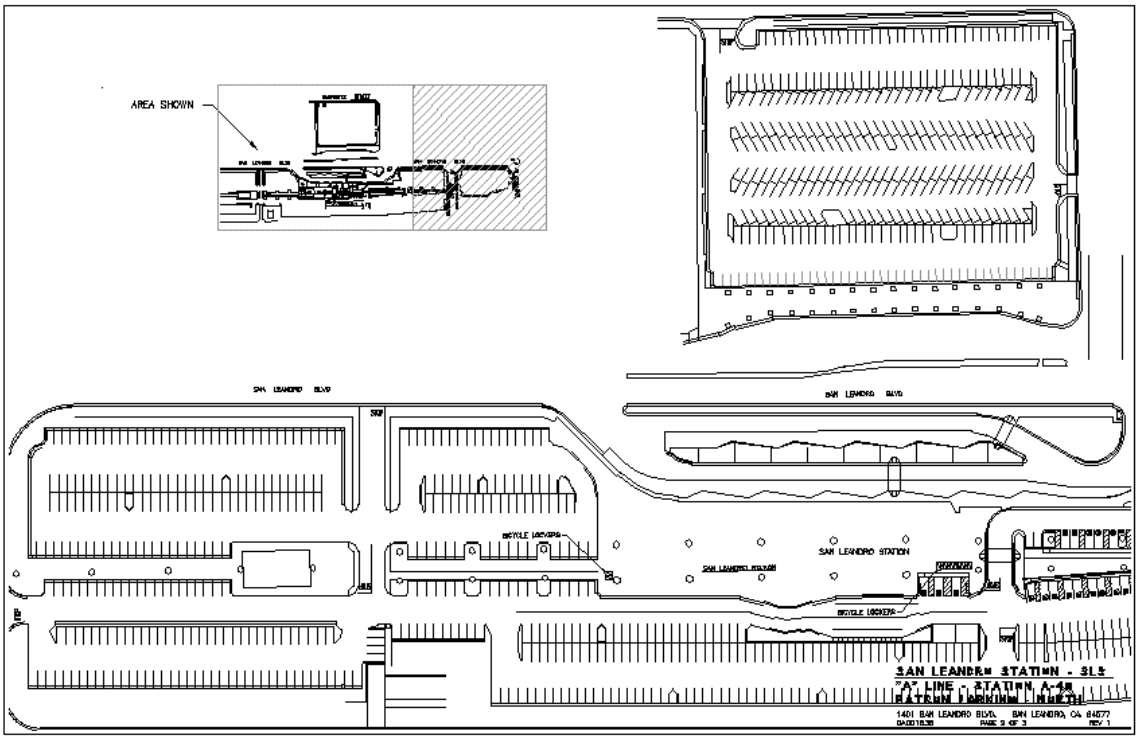

Figure 12. San Leandro Station, North Portion

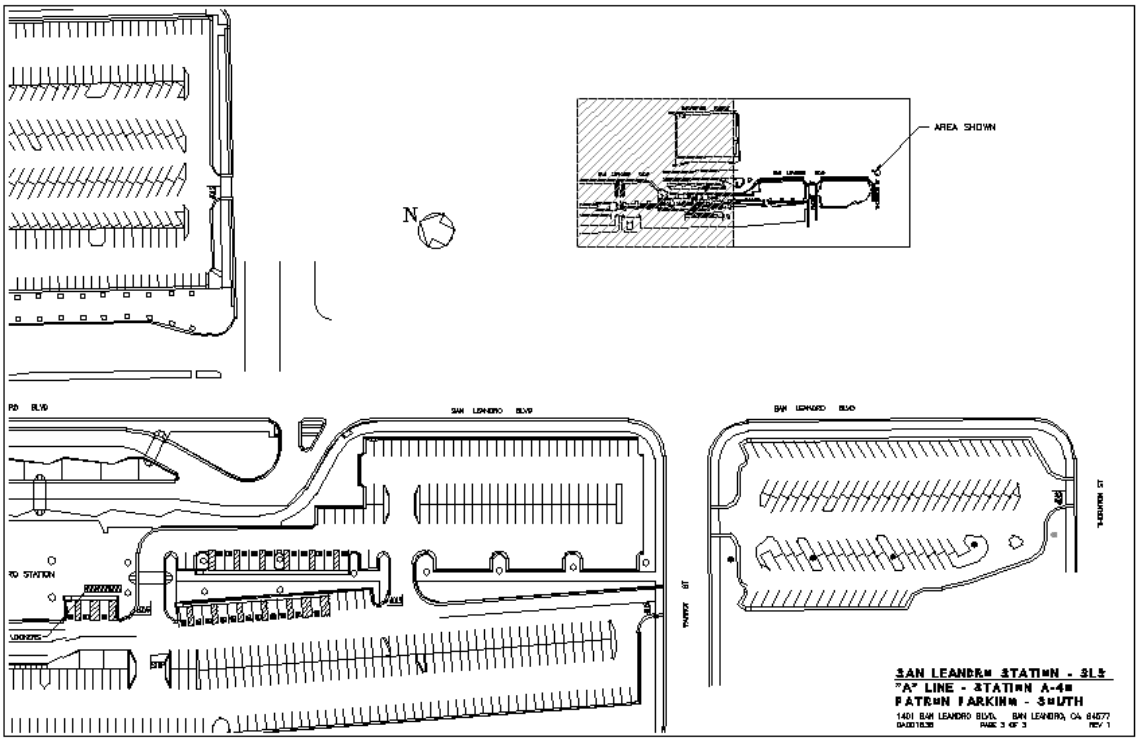

Figure 13. San Leandro Station, South Portion

Tables 32 and 33 and Figure 14 (next two pages) summarize station context, access, and replacement parking circumstances for San Leandro.

Table 32. San Leandro Station Context

Category	Characteristic	Condition
Station characteristics	Station type*	Suburban center
	Transportation function	Origin and destination
	Station weekday ridership '04 (exits)**	4,790
	Average weekday round trip fare paid from station***	$5.28
	Weighted average service density***	21.6 trains per hour
	Station draw****	Most weekday home origins come from a 1–1.5 mile radius of the station
Station area characteristics	Population w/in ½ mile**	7,761
	Employment w/in ½ mile**	5,434
Parking	BART parking*****	1,234
	Parking utilization @ 1 PM*****	100%
	Reliance on parking (number of BART spaces per weekday rider)	0.26
	Other parking-related access issues	City's plans seek an expansion of BART parking in a structure on BART's land immediately west of the station, with parking charges on *new* stalls. Relocation would facilitate city redevelopment plans. Overflow parking is occurring on private property (illegally), along Martinez Street, and other on-street locations.
Other access modes	Transit****	Station transit access is 15%. AC Transit may implement a BRT project.
	Shuttles	Shuttle to West San Leandro business district uses an assessment district. Interest in evaluating neighborhood shuttle.
	Pedestrian****	Station pedestrian access is 18%. West Estudillo Avenue is being improved for better access to downtown. Also plans for improving West Juana Avenue and Alvarado Street. The Union Pacific right of way could be used to improve pedestrian access to residential areas and future development
	Bicycle****	Station bicycle access is 2%. Bicycle access growth potential identified as "medium" and bicycle parking improvement identified as "high". The Union Pacific row improve bicycle access to residential areas and future development.
BART Plans	Access plan?	Yes
	Comprehensive Station Plan?	No
City Plans		Strategic Plan adopted
Transit Operator Plans		Not known.
Status of development solicitation		Authorized to issue solicitation

* From station spreadsheet prepared by the Center for Transit Oriented Development, dated 7/29/04
** From station spreadsheet prepared by F&P Associates, dated 8/2/04
*** Tabulations provided by BART staff.
**** From BART Station Profile Study, BART Office of External Affairs, August 1999.
***** From BART Stations-Parking Facility Occupancy Survey, Wilbur Smith Associates, April 20-May 6, 2004.

Figure 14 shows the home address of people participating in the reserved parking program. This provides a current assessment of the station's draw among automobile drivers. This distribution does not necessarily represent all drivers to the station, because it captures only those who choose to participate in the reserved parking program.

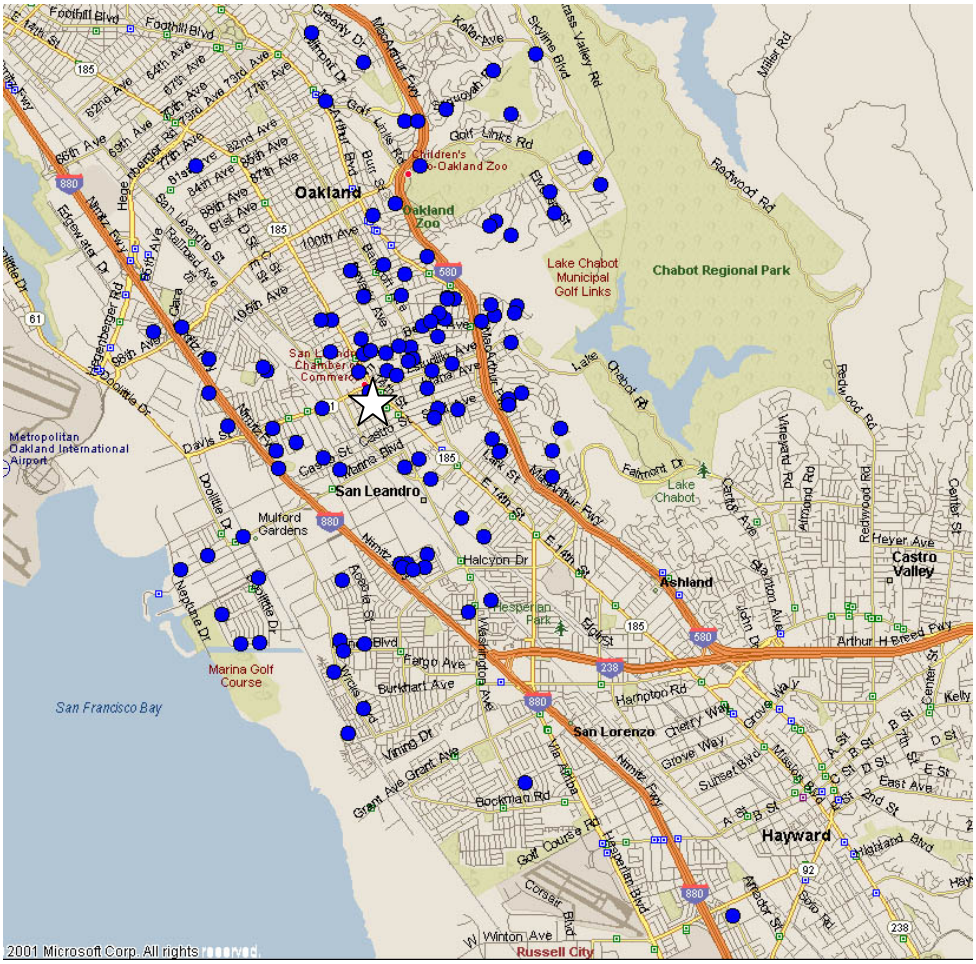

Figure 14. Station Draw for San Leandro Station (reserved parking participants)

Table 33. San Leandro Replacement Parking Possibilities

Issue	Status
Is station parking fully utilized?	Monitoring data indicate that parking is 100% full at 1:00 pm.
Is nearby, non-BART parking fully utilized?	Yes.
Can replacement parking be provided off-site or in shared arrangements?	There are multiple options for replacement parking, depending on which property owners might participate in a joint development. These options apply to constructing new parking facilities, sharing existing parking facilities, and creating new joint use facilities.
Can parking demand be shifted to other stations?	Shifting parking between Bay Fair and San Leandro is a possibility that should be explored. The concept would require the interest and participation of property owners at Bay Fair. Issues of liability is shared parking would have to be addressed. Shifting parking to the Coliseum station is another possibility, given the geographic distribution of permit parking at San Leandro.
Are there possibilities for replacement parking funding from other parties (e.g., grant funds, redevelopment)?	Land around station is a redevelopment project area. No grant funds pending.
What is city perspective on deviation from 1:1 replacement parking?	Current view is that there is not enough BART parking. The expectation is that city council would require 1:1 replacement or even greater than 1:1 replacement (an augmentation to total station parking supply). Perceptions about parking in the station area are shaped by neighborhood parking issues related to a condominium development.
What other planning issues exist?	Lack of resolution of how other property owners might participate in station area development adds uncertainty. The existing Union Pacific railroad tracks hamper the ability to develop joint development proposals to the west side of the station.
What is the parking management readiness in the station area, i.e., does the city and property owners have spillover prevention programs ready (e.g., permits, meters, time limits)?	Spillover is currently a problem, on-street (where there is not a permit parking program) and off-street in some vacant land parcels. This has created issues with neighbors and safety issues (e.g., cars parked too close to the railroad tracks). The city has precedent for permit parking, but only around high schools. Permit parking requires neighborhood initiation. There is neighborhood sensitivity because an existing condominium is putting pressure on on-street parking.

Table 34 draws from the information presented above in summarizing the top five policy and context issues for San Leandro.

Table 34. Top Five San Leandro Policy and Context Issues

Issue	Relevance to the Access/Replacement Parking
1) Coordinated property owner approaches to parking could yield efficiencies and opportunities for shared parking.	Current scenario is development of a 2.2 acre site that does not provide such opportunities.
2) City does not currently have permit parking around station. Spillover parking potential is a concern.	Permit parking programs in neighborhoods are needed before more aggressive parking approaches are possible.
3) Some stakeholders want increased BART parking to be a requirement of a joint development.	Financial burden of exceeding 1:1 replacement is large and may prohibit development.
4) There is good potential for additional pedestrian access.	Future joint development and city projects might consider jointly implementing pedestrian improvements.
5) Most station users live relatively close to the station.	Local shuttles have good potential.

Assumptions

Although a variety of development scenarios are possible for San Leandro, the far reaching ones require the participation of private land owners. Given that there is not a pending partnership for a multi-parcel strategy, the San Leandro scenarios examine a development on one part of the BART parking lot. Some access/replacement parking strategies will not be appropriate until the spillover concern is addressed through parking management tools. The City's Strategic Plan calls for more than 1:1 replacement of BART parking, with parking charges on the additional spaces. Because the city is concerned about parking spillover issues, parking charges were not included in any of the scenarios. Should the city develop parking control measures to assure appropriate control of spillover, parking charges could be considered in future scenarios. The following assumptions are detailed in Table 35.

- Parcel size is 95,832 square feet, located on the BART surface lot on the east side of San Leandro Boulevard.
- Use development concept from the Central San Leandro/BART Area Revitalization Strategy for units on the 2.2 acre BART parking surface lot.
- Scenarios A and B (Conservative): 132 units, 1.5 parking spaces per unit, no retail. Scenario A has 110% replacement parking while Scenario B has 90% replacement parking. No daily parking charge assumed.
- Scenario C (Moderate): 200 units @ 1.5 parking spaces per unit, no retail. Scenario C has 80% replacement parking. No daily parking charge assumed.

Table 35. San Leandro Station Scenarios Working Assumptions

	Existing Condition	**Scenario A:** Conservative, 110% replacement	**Scenario B:** Conservative, 90% replacement	**Scenario C:** Moderate, 80% replacement
Units per acre	0	60	60	90
# units residential (rental)	0	132	132	200
# of BART parking spaces on-site	341	375	307	273
Parking spaces for joint development		198	198	300
Total non-shared spaces (BART + joint development)		573	505	573
Parking charges on the BART parking	$0, $42 per month on 226 reserved.	$0, $42 per month on 226 reserved.	$0, $42 per month on 226 reserved.	$0, $42 per month on 226 reserved.
New transit/shuttle programs		None	None	New neighborhood shuttle services.
New walk/bike programs		West Estudillo Avenue improvements, other streetscape improvements.	West Estudillo Avenue improvements, other streetscape improvements.	West Estudillo Avenue improvements, other streetscape improvements.
New on-street parking management programs (e.g., permit or time limits)		City considering charging for long-term parking along Martinez Street.	City considering charging for long-term parking along Martinez Street.	City considering charging for long-term parking along Martinez Street.
Economic issues		Costs developer an extra $0.5 million @ $15k per space.	Saves developer $0.5 million @ $15k per space.	Saves developer $1.0 million @ $15k per space.
Local barriers to TOD and how they are addressed		Parking requirement increases barriers.	Would require local permit parking.	Would require local permit parking.

Table 36 summarizes the ridership impacts of the three scenarios. Scenario A provides the biggest boost to ridership because the joint development is combined with 110% replacement parking. Scenarios B and C show smaller ridership increases. In all cases, the scale of impact is minor because the amount of development is relatively small.

Table 36. San Leandro Weekday Ridership Impact Summary

	Scenario A	**Scenario B**	**Scenario C**
Ridership impact of joint development	145	145	219
Ridership impact of change in BART parking supply	75	-49	-99
Ridership impact of parking charge programs	0	0	0
Ridership of other access programs	0	0	0
Net impact on BART boardings	220	95	121
Reduction in drive alone share	Minor	Minor	Minor

Table 37 summarizes the fiscal impacts of the three scenarios. All the scenarios involve a negative parking-related ground rent, meaning that the cost of replacement parking exceeds the value of the ground rent expected at fair market value. Under such circumstances, another entity (such as a redevelopment agency) could contribute to replacement parking costs to make the ground rent a positive cash flow for BART. Scenarios A and B produces a negative fiscal impact. Scenario C is close to neutral, but still negative and well within the range of error.

Table 37. San Leandro Fiscal Checklist

		Scenario A	Scenario B	Scenario C
Annual **revenue** factors	Fares from net change in riders	$154,394	$67,067	$84,783
	Parking charges (net)	$0	$0	$0
	Ground rent associated with change in replacement parking [15]	($251,046)	($149,046)	($98,046)
	Annualized value of external grant/partnership support	$0	$0	$0
Annual **cost** factors	BART parking operating costs (maint., security,)	($81,221)	($44,683)	($26,384)
	New operating costs for BART service	$0	$0	$0
	BART part. in operating costs for new access modes	$0	$0	$0
	BART part. in access capital improvements (annualized)	$0	$0	$0
Net annual impact (sum of revenues and costs)		**($177,873)**	**($128,641)**	**($39,646)**

Table 38 shows the summary results of the three scenarios. The scenarios produce negative financial results from BART's perspective. It shows that modestly scaled development, when burdened with the obligation of full parking replacement, does not pencil out. Since substantial development opportunities exist in the broader station area, it is preferable to prepare a more comprehensive development solicitation that includes adjacent properties.

[15] Note: this is ground rent associated with changes in parking requirements only. It does not reflect additional ground rent associated with the higher development intensities of some scenarios or other forms of revenue participation.

Table 38: San Leandro Summary Evaluation Matrix

Criteria	**Scenario A**	**Scenario B**	**Scenario C**
Ridership: net annual ridership impact (from Table 36)	220	95	121
Revenues and costs: net annual impact, $/year (from Table 37)	($177,873)	($128,641)	($39,646)
Station access mode: **reduction in drive alone share** (from Table 36)	Minor	Minor	Minor
Long-term BART capacity	Retains BART land in surface parking, which provides flexibility in the future.	Retains BART land in surface parking, which provides flexibility in the future.	Retains BART land in surface parking, which provides flexibility in the future.
BART Plans: support Comprehensive Station Plans and access targets.	Scale of development is small. Greater than 1:1 replacement parking is not consistent with BART access targets.	Scale of development is small.	Scale of development is small.
Local goals: Context-appropriate and well-designed; local support, partnerships, reduce TOD barriers (qualitative).	Consistent with local plans.	Small scale of development per local plans.	Small scale of development per local plans.
Regional goals: e.g., provision of housing, housing affordability, congestion, air quality, etc. (qualitative)	110% replacement not supportive of regional initiatives.	Limited effect.	Limited effect.

Chapter 5. Conclusions and Next Steps

Conclusions

This report presents a set of principles and a methodology for consideration by BART in making decisions on access and replacement parking for joint development projects. The intention is to indicate BART's priorities in making these decisions, but to allow for variation depending on specific station conditions. Given that joint development projects are pursued in collaboration with local cities and other parties, the methodology provides a way of displaying and sharing information about the performance of joint development and replacement parking/access scenarios. It is intended to further collaborations and partnerships with those parties.

Four stations are used as case studies. The scenarios shown do not exhaust the possibilities for the stations, nor should they be construed as particular recommendations. Rather, the case studies are used to test and refine the methodology and to shed light on promising access/replacement parking decisions. More detailed analysis is required to effectively collaborate with local jurisdictions transit operators and others in specifying development solicitation terms and entering into development agreements.

The following insights have been gained in using the methodology.

- Joint development projects can produce a substantial stream of revenue from increased fares and ground rent. Finding creative access/replacement parking arrangements can make joint development feasible and unlock this revenue source. This reliable, unrestricted cash flow can support BART's capital and operating needs and it can enable BART to contribute to partnerships to improve bus/shuttle access and provide capital for access improvements. The results show that leaving BART land resources in surface parking involves a substantial opportunity cost.
- Small scale development with a developer obligation for full replacement parking often produces a negative ground rent, requiring a subsidy from other sources. The increase in parking operating costs associated with a shift toward structured parking (versus surface parking) further burdens these scenarios.
- Scenarios that involve less than full replacement parking, alternative access improvements, and parking charges produce the most positive overall outcomes for BART. This suggests that BART should require an evaluation of alternatives to 1:1 replacement on all its joint development projects.
- Market feasibility and pro forma analysis is needed to determine the additional ground rent possible from more intense development as shown in some of the scenarios. It was beyond the scope of this analysis to consider the effect of greater development intensity on ground rent. In all cases, the aggressive scenario has a larger financial upside than shown here.
- The most promising opportunities are those that involve coordinating multiple station area property owners so that efficiencies in access and parking can be achieved, so that shared parking is possible and convenient, and so that station area land can be optimally planned.

- Higher parking charges produce revenue that can fund a host of innovative access improvements. These resources should not replace resources that would have been provided by developers, cities, or other transit providers, but they can be used to leverage a greater level of access improvement than might otherwise been available. Stakeholders are concerned about the future of bus service levels at BART stations, making funding partnerships particularly important.
- More knowledge about the future of station access modes would assist in the evaluation of scenarios. That knowledge includes the plans of those who provide access to BART stations, funding scenarios, the likelihood of new access modes, and pressures brought about by increases in ridership. Station specific access targets or performance measures would add a useful dimension to the methodology.

Insights on the four case study stations are summarized below:

Concord.

This is the only case study where there is currently some unused parking. This means that the parking supply can be reduced without ridership loss, up to the number of empty spaces. It also means that pricing is likely to result in a small ridership loss, since there is not latent demand. All the Concord scenarios tested show promise. Scenario C involves a modest $1 parking charge on 75% of the spaces and generates almost $1.2 million per year. Scenario C also includes a BART capital contribution to pedestrian improvements in the station area and support for local shuttles. More aggressive parking pricing strategies could produce more resources for other access modes or other uses.

Del Norte

All the Del Norte scenarios relocate replacement parking across the street from the BART station, for cost savings and design reasons. The most aggressive scenario, Scenario C, produces $865,626 of revenue per year. All scenarios include a BART capital contribution improvement to support the parking relocation. The key issue in deciding among the scenarios is the degree to which BART and its partners wish to keep the station as an automobile park-and-ride type of station as opposed to transitioning to a TOD district. Scenario C would also require changes in the City's density and height limitations so that the development scenario could be achieved.

MacArthur

The MacArthur station has the most urban context of the four stations studied. As such, a wider variety of replacement parking and access program are considered, including 50% replacement parking and BART contribution to partnership to support improved bus/shuttle service and access capital improvements. Scenario C, which includes a $3 per day parking charge, produces over $1.0 million in annual revenues for BART and a contribution to capital improvements and transit access operating funds.

San Leandro

The San Leandro scenarios consider a 2.2 acre portion of BART's land. More comprehensive scenarios are possible (and desirable) if the cooperation of other property owners is secured. All scenarios show a negative ground rent projection. Scenario A, which involves 110% replacement parking, shows the most negative ground rent projection, indicating that public contributions greater than BART's entire ground rent would be required to make a development feasible. The other scenarios involve modest developments and modest adjustments to replacement parking scenarios. All scenarios produce a net loss for BART. In this case, it is better to pursue a larger, more comprehensive joint development scheme that involves other property owners.

Next Steps

Suggested next steps include the following:

- BART staff and external stakeholders review this draft methodology.
- BART staff considers future trends in station access modes and the possibility of establishing station level access targets or performance measures to assist in assessing access/replacement parking scenarios.
- BART Board reviews and adopts the access/replacement parking principles and endorses of use of the methodology.
- BART staff incorporates access/replacement parking scenario development and testing into joint development implementation and project negotiations. Staff or consultants develop market feasibility and pro forma analysis procedures to test the ground rent estimates provided in this methodology.

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Appendix A

Synopsis of Guidance from Existing Policies

Strategic Plan Vision (1999)

- "Partner with communities…to make investment choices which encourage, support, and enhance transit-oriented development and use of transit." Suggests station-specific approaches.

Strategic Plan Focus Areas (1999)

- "Building partnerships for support" and "land use and quality of life." Both suggest tailoring approaches to station and line segment characteristics rather than across-the-board approaches

Strategic Initiatives (various)

- Replacement parking question influenced by the following strategic initiatives: Access Management and Improvement, Station Area Planning, Sustainability, and Financial Stability policies, and the System Capacity and Ridership Growth & Retention programs

Five- and Ten-year Access Targets (2000)

- Access targets call for a gradual reduction in the percentage of BART patrons arriving by single occupant automobile through 2010. However, the increase in ridership indicates that the absolute number of parking spaces will need to increase.

Station Area Access Plans and Station Area Comprehensive Plans (various)

- Example: Del Norte Comprehensive Station Plan acknowledges the financial challenge of replacement parking, proposes creative ways to fulfill replacement parking, such as shared parking or satellite parking.

Station Area Development Implementation Policy (6/7/84)

- Goal: to generate new sources of income (and/or capital offsets) and to increase transit ridership through cooperative public/private sector development projects on or near District-owned properties.
- Objectives: 1) to coordinate comprehensive planning and development around stations; 2) to enhance local community economic development efforts through better utilization of transit and transit-owned properties; 3) to return real property to the tax rolls and to increase the community tax base; 4) to help create new investment opportunities for the private sector which are supportive of transit; and 5) to reduce auto use and traffic congestions through the encouragement of transit-linked development.

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Appendix B
Spreadsheets for Methodology

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Trip Generation

Scenario A

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	0	6.63	0				
Res. work trips				0.25	0	40.5	0
Res. non-work				0.75	0	8.55	0
Retail	0	58.59	0			11.7	0
Medical office	0	36.13	0			10	0
Total rail trips							-

Scenario B

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	0	6.63	0				
Res. work trips				0.25	0	40.5	0
Res. non-work				0.75	0	8.55	0
Retail	0	58.59	0			11.7	0
Medical office	0	36.13	0			10	0
Total rail trips							-

Scenario C

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	0	6.63	0				
Res. work trips				0.25	0	40.5	0
Res. non-work				0.75	0	8.55	0
Retail	0	58.59	0			11.7	0
Medical office	0	36.13	0			10	0
Total rail trips							-

Notes:

Residential trip generation from ITE 6th Edition rate for apartment
Retail trip generation from ITE 6th Edition rate for 80% specialty retail center and 20% high turnover sit down restaurant
Office trip generation from ITE 6th Edition rate for general office
Medical office trip generation from ITE 6th Edition for medical/dental office
Residential work trip share based on average of rail shares for Pleasant Hill and S. Alameda County, Table 5-8, page 46, CA TOD Report

Residential non-work trip share based on an average of rail shares for Pleasant Hill and S. Alameda County, Table 5-11, page 51 CA TOD Report
Retail rail share based on rail share for El Cerrito Plaza, Table 7-7, page 109 CA TOD Report.

Medical office share is an estimate

Ridership Impact from Parking Charges

Parking charge (Scenario B)	**$**	**-**
Parking Charge (Scenario C)	**$**	**-**
Elasticity assumption		**-0.33**
Percent boardings that switch to another access mode and continue to use BART		**0%**

Checklist

Is parking 90% full by 9:00 AM? → No

Yes

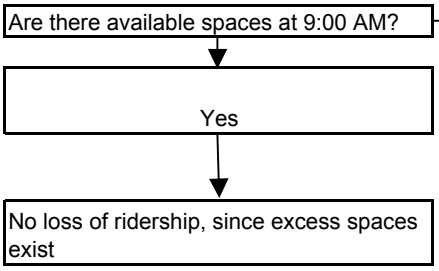
Assume latent demand replacement for any riders who stop using BART because of parking charges

Number of spaces affected	-
Boardings per space	0
Station boardings affected by parking charges	-
Combined elasticity	-0.33
Current average round trip fare	$0.00
Combined parking/fare	$0.00
Percent fare/parking increase	
Elasticity effect	
Number of boardings potentially lost	
Percent boardings that find another access mode and continue to use BART	
BART boardings retained, change to another access mode	
Net boarding loss	
Ridership loss @ 2 trips per station boarding	

Ridership Impact from Changes in Parking Supply

If the number of spaces for BART patrons are reduced, then riders may be displaced. This analysis assumes that a percent of riders switch to another BART access mode when their space is removed, and are therefore retained as BART riders. 1998 BART Access study provides a guide on the overall mode choice pattern at the station.

Checklist



	Scenario A	Scenario B	Scenario C
Number of spaces reduced	-	0	0
Space turnover (cars parked per day)	1	1	1
Number of people per car	1.1	1.1	1.1
Number of auto access boardings reduced		0	0
Percent that find another access mode and continue to use BART	0%	0%	0%
BART boardings retained, change to another access mode	-	-	-
Net boardings loss	-	-	-
Ridership loss @ 2 trips per station boarding	0	0	0

Change in Parking Operating Costs

Annual cost per surface space	$ 353.04
Annual cost per structure space	$ 537.62

Operating costs derived from BART Memo on parking costs dated 10/12/2000, Scott Mill author, inflated to 2004 using percentage increases of 6%, 5%, 5%, and 6%, per BART guidance 1/5/05.

	Scenario A	Scenario B	Scenario C
Existing Condition			
Number of surface spaces			
Surface space operating costs	$ -	$ -	$ -
Number of structure spaces			
Structure space operating costs	$ -	$ -	$ -
Total parking operating costs	$ -	$ -	$ -
Scenario			
Number of surface spaces			
Surface space operating costs	$ -	$ -	$ -
Number of structure spaces			
Structure space operating costs	$ -	$ -	$ -
Total parking operating costs	$ -	$ -	$ -
Change in parking operation costs	$0	$0	$ -

Impact on Costs and Revenues

Revenue factors

	Scenario A		Scenario B		Scenario C	
Fare revenue	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*
Ridership impact of joint development	0		0		-	
Ridership impact of change in pkg. supply	0		0		0	
Ridership impact of parking charge programs	0		0		0	
Ridership impact of other access programs					0	
Net change in ridership	0		0		-	
Average fare	$ -		$ -		$ -	
Fare revenue		**$ -**		**$ -**		**$ -**
Parking revenue						
Change in number of space under reserved parking	0		0		0	
Monthly cost of reserved parking	$ -		$ -		$ -	
Cost of collection	10%		10%		10%	
Net revenue from reserved parking		**$ -**		**$ -**		**$ -**
Number of spaces under paid parking	0		0		0	
Daily parking price	$ -		$ 3.00		$ 5.00	
Cost of collection	30%		30%		30%	
Annualized capital cost of parking chg. equipment	$ -		$ -		$ -	
Net revenue from parking charges		$ -		$ -		$ -
Combined parking revenue		**$ -**		**$ -**		**$ -**
Ground rent after replacement parking						
Fair market land value	$0.00		$0.00		$0.00	
Parcel size	-		-		-	
Land value	$ -		$ -		$ -	
Replacement capital cost per space	$ 15,000		$ 15,000		$ 15,000	
Number of spaces replaced	0		0		0	
Cost of replacement parking	$ -		$ -		$ -	
Residual	$ -		$ -		$ -	
Annualization factor	0.1		0.1		0.1	
Ground rent after parking costs		**$ -**		**$ -**		**$ -**
Grant/partnership revenue						
Amount	0		0		0	
Annualization factor	0.1		0.1		0.1	
Annualized grant/partnership revenue		$ -		$ -		$ -
Total annual revenue		**$ -**		**$ -**		**$ -**

Cost factors

Change in parking operating costs						
Parking operating costs		**$ -**		**$ -**		**$ -**
BART operating costs						
Other BART costs (e.g., new service, imp. etc.)		$ -		$ -		$ -
BART participation in other access operating costs						
Amount		**$ -**		**$ -**		**$ -**
BART participation in other access capital costs						
One-time capital cost	$ -		$ -		$0	
Annualization factor	0.1		0.1		0.1	
Annualized capital costs		**$0**		**$0**		**$0**
Total annual cost		**$ -**		**$ -**		**$ -**
Net annual impact		**$ -**		**$ -**		**$ -**

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Appendix C

Case Study Spreadsheet Calculations

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Trip Generation from Concord Joint Development

Scenario A

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	420	6.63	2,785				
Res. work trips				0.25	696.2	40.5	282
Res. non-work				0.75	2088.5	8.55	179
Retail	5,000	58.59	293			5.85	17
Total rail trips							**478**

Scenario B

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	487	6.63	3,229				
Res. work trips				0.25	807.2	40.5	327
Res. non-work				0.75	2421.6	8.55	207
Retail	5,000	58.59	293			5.85	17
Total rail trips							**551**

Scenario C

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	615	6.63	4,077				
Res. work trips				0.25	1019.4	40.5	413
Res. non-work				0.75	3058.1	8.55	261
Retail	5,000	58.59	293			5.85	17
Total rail trips							**691**

Notes:

Residential trip generation from ITE 6th Edition rate for apartment

Retail trip generation from ITE 6th Edition rate for 80% specialty retail center and 20% high turnover sit down restaurant

Office trip generation from ITE 6th Edition rate for general office

Residential work trip share based on average of rail shares for Pleasant Hill and S. Alameda County, Table 5-8, page 46 CA TOD Report

Residential non-work trip share based on an average of rail shares for Pleasant Hill and S. Alameda County, Table 5-11, page 51 CA TOD Report

Retail rail share based on 50% of the rail share for El Cerrito Plaza, Table 7-7, page 109 CA TOD Report. Half of El Cerrito share used because small amount of retail is primarily local serving uses.

Ridership Impact from Parking Charges - Concord Scenario C

Parking Charge (Scenario C)	**$**	**1.00**
Elasticity assumption		-0.33
Percent boardings that switch to another access mode and continue to use BART		22%

Checklist

Is parking 90% full by 9:00 AM? → No

Yes

Assume latent demand replacement for any riders who stop using BART because of parking charges

Number of spaces affected	1,576
Boardings per space	1.1
Station boardings affected by parking charges	1,734
Combined elasticity	-0.33
Current average round trip fare	$6.66
Combined parking/fare	$7.66
Percent fare/parking increase	15.0%
Elasticity effect	-0.05
Number of boardings potentially lost	86
Percent boardings that find another access mode and continue to use BART	22%
BART boardings retained, change to another access mode	19
Net boarding loss	67
Ridership loss @ 2 trips per station boarding	134

Ridership Impact from Changes in Concord Station Parking Supply

If the number of spaces for BART patrons are reduced, then riders may be displaced. This analysis assumes that 22 percent of riders switch to another BART access mode when their space is removed, and are therefore retained as BART riders. Note that nega

Checklist

Are there available spaces at 9:00 AM? → No

Yes

No loss of ridership, since excess spaces exist

	Scenario A	Scenario B	Scenario C
Number of spaces reduced (added)	-	0	37
Space turnover (cars parked per day)	1	1	1
Number of people per car	1.1	1.1	1.1
Number of auto access boardings reduced (added)	0.0	0	40.7
Percent that find another access mode and continue to use BART	22%	22%	22%
BART boardings retained		-	9
Net boardings loss (gain)	-	-	32
Ridership loss (gain) @ 2 trips per station boarding	0	0	63

Concord Change in Parking Operating Costs

Annual cost per surface space	$ 353.04
Annual cost per structure space	$ 537.62

Operating costs derived from BART Memo on parking costs dated 10/12/2000, Scott Mill author, inflated to 2004 using percentage increases of 6%, 5%, 5%, and 6%, per BART guidance 1/5/05.

	Scenario A	Scenario B	Scenario C
Existing Condition			
Number of surface spaces	1,513	1,513	1,513
Surface space operating costs	$ 534,150	$ 534,150	$ 534,150
Number of structure spaces	854	854	854
Structure space operating costs	$ 459,127	$ 459,127	$ 459,127
Total parking operating costs	$ 993,277	$ 993,277	$ 993,277
Scenario			
Number of surface spaces	981	981	981
Surface space operating costs	$ 346,332	$ 346,332	$ 346,332
Number of structure spaces	1,386	1,253	1,120
Structure space operating costs	$ 745,141	$ 673,638	$ 602,134
Total parking operating costs	$ 1,091,474	$ 1,019,970	$ 948,467
Change in parking operation costs	($98,197)	($26,693)	$ 44,810

Impact on Costs and Revenues - Concord

Revenue factors

	Scenario A		Scenario B		Scenario C	
Fare revenue	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*
Ridership impact of joint development	478		551		691	
Ridership impact of change in pkg. supply	0		0		-63	
Ridership impact of parking charge programs	0		0		-134	
Ridership impact of other access programs	0		0		25	
Net change in daily ridership	478		551		519	
Average fare	$ 3.33		$ 3.33		$ 3.33	
Annual fare revenue		**$ 423,721**		**$ 488,889**		**$ 460,368**
Parking revenue						
Change in number of space under reserved parking	0		0		0	
Monthly cost of reserved parking	$ 42.00		$ 42.00		$ 42.00	
Cost of collection	10%		10%		10%	
Net revenue from reserved parking		**$ -**		**$ -**		**$ -**
Number of spaces under paid parking	0		0		1,576	
Daily parking price	$ 1.00		$ 1.00		$ 1.00	
Cost of collection	30%		30%		30%	
Annualized capital cost of parking chg. equipment	$ -		$ -		$ 34,863	
Net revenue from parking charges		**$ -**		**$ -**		$ 251,923
Combined parking revenue		**$ -**		**$ -**		**$ 251,923**
Ground rent after replacement parking						
Fair market land value	$ 27.50		$ 27.50		$ 27.50	
Parcel size	339,768		339,768		339,768	
Land value	$ 9,343,620		$ 9,343,620		$ 9,343,620	
Replacement capital cost per space	$ 15,000		$ 15,000		$ 15,000	
Number of spaces replaced	532		399		266	
Cost of replacement parking	$ 7,980,000		$ 5,985,000		$ 3,990,000	
Residual	$ 1,363,620		$ 3,358,620		$ 5,353,620	
Annualization factor	0.1		0.1		0.1	
Ground rent after parking costs		**$ 136,362**		**$ 335,862**		**$ 535,362**
Grant/partnership revenue						
Amount	0		0		0	
Annualization factor	0.1		0.1		0.1	
Annualized grant/partnership revenue		$ -		$ -		$ -
Total annual revenue		**$ 560,083**		**$ 824,751**		**$ 1,247,653**

Cost factors

Change in parking operating costs						
Parking operating costs		**(98,197)**		**(26,693)**		**$ 44,810**
BART operating costs						
Other BART costs (e.g., new service, imp. etc.)		$ -		$ -		$ -
BART participation in other access operating costs						
Amount		**$ -**		**$ -**		**(50,000)**
BART participation in other access capital costs						
One-time capital cost	$ -		$ -		($500,000)	
Annualization factor	0.1		0.1		0.1	
Annualized capital costs		**$0**		**$0**		**($50,000)**
Total annual cost		**$ (98,197)**		**$ (26,693)**		**$ (55,190)**
Net annual impact		**$ 461,886**		**$ 798,058**		**$ 1,192,463**

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Trip Generation from Del Norte Joint Development

Scenario A

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	462	6.63	3,063				
Res. work trips				0.25	765.8	40.5	310
Res. non-work				0.75	2297.3	8.55	196
Retail	20,000	58.59	1,172			11.7	137
Total rail trips							**644**

Scenario B

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	462	6.63	3,063				
Res. work trips				0.25	765.8	40.5	310
Res. non-work				0.75	2297.3	8.55	196
Retail	20,000	58.59	1,172			11.7	137
Total rail trips							**644**

Scenario C

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	624	6.63	4,137				
Res. work trips				0.25	1034.3	40.5	419
Res. non-work				0.75	3102.8	8.55	265
Retail	20,000	58.59	1,172			11.7	137
Total rail trips							**821**

Notes:

Residential trip generation from ITE 6th Edition rate for apartment

Retail trip generation from ITE 6th Edition rate for 80% specialty retail center and 20% high turnover sit down restaurant

Office trip generation from ITE 6th Edition rate for general office

Residential work trip share based on average of rail shares for Pleasant Hill and S. Alameda County, Table 5-8, page 46 CA TOD Report

Residential non-work trip share based on an average of rail shares for Pleasant Hill and S. Alameda County, Table 5-11, page 51 CA TOD Report

Retail rail share based on rail share for El Cerrito Plaza, Table 7-7, page 109 CA TOD Report.

Ridership Impact from Parking Charges - Del Norte Scenario B and C

Parking Charge (Scenario C)	**$ 1.00**
Elasticity assumption	**-0.33**
Percent boardings that switch to another access mode and continue to use BART	**39%**

Checklist

Is parking 90% full by 9:00 AM? → No

Yes

Assume latent demand replacement for any riders who stop using BART because of parking charges

Number of spaces affected	
Boardings per space	
Station boardings affected by parking charges	
Combined elasticity	
Current average round trip fare	
Combined parking/fare	
Percent fare/parking increase	
Elasticity effect	
Number of boardings potentially lost	
Percent boardings that find another access mode and continue to use BART	
BART boardings retained, change to another access mode	
Net boarding loss	
Ridership loss @ 2 trips per station boarding	

Ridership Impact from Changes in Del Norte Station Parking Supply

If the number of spaces for BART patrons are reduced, then riders may be displaced. This analysis assumes that 39 percent of riders switch to another BART access mode when their space is removed, and are therefore retained as BART riders.

Checklist

Are there available spaces at 9:00 AM?

Yes

No loss of ridership, since excess spaces exist

No

	Scenario A	Scenario B	Scenario C
Number of spaces reduced	-	224	449
Space turnover (cars parked per day)	1	1	1
Number of people per car	1.1	1.1	1.1
Number of auto access boardings reduced		246.4	493.9
Percent that find another access mode and continue to use BART	39%	39%	39%
BART boardings retained, change to another access mode	-	96	193
Net boardings loss	-	150	301
Ridership loss @ 2 trips per station boarding	0	301	603

Del Norte Change in Parking Operating Costs

Annual cost per surface space	$ 353.04
Annual cost per structure space	$ 537.62

Operating costs derived from BART Memo on parking costs dated 10/12/2000, Scott Mill author, inflated to 2004 using percentage increases of 6%, 5%, 5%, and 6%, per BART guidance 1/5/05.

	Scenario A	Scenario B	Scenario C
Existing condition			
Number of surface spaces	898	898	898
Surface space operating costs	$ 317,030	$ 317,030	$ 317,030
Number of structure spaces	1,300	1,300	1,300
Structure space operating costs	$ 698,906	$ 698,906	$ 698,906
Total parking operating costs	$ 1,015,936	$ 1,015,936	$ 1,015,936
Scenario			
Number of surface spaces	-	-	-
Surface space operating costs	$ -	$ -	$ -
Number of structure spaces	2,198	1,974	1,749
Structure space operating costs	$ 1,181,689	$ 1,061,262	$ 940,297
Total parking operating costs	$ 1,181,689	$ 1,061,262	$ 940,297
Change in parking operation costs	$ (165,753)	$ (45,326)	$ 75,639

Impact on Costs and Revenues - Del Norte

Revenue

	Scenario A		Scenario B		Scenario C	
Fare revenue	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*
Weekday riders from joint development	644		644		821	
Riders lost because of parking reduction	0		-301		-603	
Riders lost because of parking charges					0	
Rider gained because of new access programs						
Net change in ridership	644		343		219	
Average fare	$ 2.72		$ 2.72		$ 2.72	
Fare revenue		**$ 466,397**		**$ 248,574**		**$ 158,485**
Parking revenue						
Change in number of space under reserved parking	0		0		0	
Monthly cost of reserved parking	$ 42.00		$ 42.00		$ 42.00	
Cost of collection	10%		10%		10%	
Net revenue from reserved parking		$ -		$ -		**$ -**
Number of spaces under paid parking	0		1,099		1,648	
Daily parking price	$ 1.00		$ 1.00		$ 1.00	
Cost of collection	30%		30%		30%	
Annualized capital cost of parking chg. equipment	$ -		$ 24,315		$ 36,462	
Net revenue from parking charges		**$ -**		$ 175,703		$ 263,474
Combined parking revenue		**$ -**		**$ 175,703**		**$ 263,474**
Ground rent after replacement parking						
Fair market land value	$ 30.00		$ 30.00		$ 30.00	
Parcel size	418,176		418,176		418,176	
Land value	$ 12,545,280		$ 12,545,280		$ 12,545,280	
Replacement capital cost per space	$ 17,500		$ 17,500		$ 17,500	
Number of spaces replaced	956		717		478	
Cost of replacement parking	$ 16,730,000		$ 12,547,500		$ 8,365,000	
Residual	$ (4,184,720)		$ (2,220)		$ 4,180,280	
Annualization factor	0.1		0.1		0.1	
Ground rent after parking costs		**$ (418,472)**		**$ (222)**		**$ 418,028**
Grant/partnership revenue						
Amount	0		0		0	
Annualization factor	0.1		0.1		0.1	
Annualized grant/partnership revenue		$ -		$ -		$ -
Total annual revenue		**$ 47,925**		**$ 424,055**		**$ 839,987**

Costs

Change in parking operating costs						
Parking operating costs		**($165,753)**		**($45,326)**		**$ 75,639**
BART operating costs						
Other BART costs (e.g., new service, imp. etc.)		$ -		$ -		$ -
BART participation in other access operating costs						
Amount		**$ -**		**$ -**		
BART participation in other access capital costs						
One-time capital cost	$ (500,000)		$ (500,000)		($500,000)	
Annualization factor	0.1		0.1		0.1	
Annualized capital costs		**($50,000)**		**($50,000)**		**($50,000)**
Total annual cost		**$ (215,753)**		**$ (95,326)**		**$ 25,639**
Net annual impact		**$ (167,828)**		**$ 328,729**		**$ 865,626**

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Trip Generation from MacArthur Joint Development

Scenario A

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	575	6.63	3,812				
Res. work trips				0.25	953.0625	40.5	386
Res. non-work				0.75	2859.1875	8.55	244
Retail	41,000	58.59	2,402			11.7	281
Medical office	14,000	36.13	506			10	51
Total rail trips							**962**

Scenario B

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	575	6.63	3,812				
Res. work trips				0.25	953.0625	40.5	386
Res. non-work				0.75	2859.1875	8.55	244
Retail	41,000	58.59	2,402			11.7	281
Medical office	14,000	36.13	506			10	51
Total rail trips							**962**

Scenario C

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	650	6.63	4,310				
Res. work trips				0.25	1077.375	40.5	436
Res. non-work				0.75	3232.125	8.55	276
Retail	103,000	58.59	6,035			11.7	706
Medical office	60,000	36.13	2,168			10	217
Total rail trips							**1,636**

Notes:

Residential trip generation from ITE 6th Edition rate for apartment
Retail trip generation from ITE 6th Edition rate for 80% specialty retail center and 20% high turnover sit down restaurant
Office trip generation from ITE 6th Edition rate for general office
Medical office trip generation from ITE 6th Edition for medical/dental office
Residential work trip share based on average of rail shares for Pleasant Hill and S. Alameda County, Table 5-8, page 46, CA TOD Report

Residential non-work trip share based on an average of rail shares for Pleasant Hill and S. Alameda County, Table 5-11, page 51 CA TOD Report
Retail rail share based on rail share for El Cerrito Plaza, Table 7-7, page 109 CA TOD Report.

Medical office share is an estimate

Ridership Impact from Parking Charges - MacArthur Scenarios B and C

Parking charge (Scenario B)	**$**	**1.00**
Parking Charge (Scenario C)	**$**	**3.00**
Elasticity assumption		**-0.33**
Percent boardings that switch to another access mode and continue to use BART		**51%**

Checklist

Is parking 90% full by 9:00 AM? → No

Yes

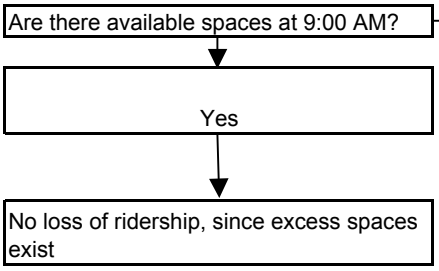
Assume latent demand replacement for any riders who stop using BART because of parking charges

Number of spaces affected	
Boardings per space	
Station boardings affected by parking charges	
Combined elasticity	
Current average round trip fare	
Combined parking/fare	
Percent fare/parking increase	
Elasticity effect	
Number of boardings potentially lost	
Percent boardings that find another access mode and continue to use BART	
BART boardings retained, change to another access mode	
Net boarding loss	
Ridership loss @ 2 trips per station boarding	

Ridership Impact from Changes in MacArthur Station Parking Supply

If the number of spaces for BART patrons are reduced, then riders may be displaced. This analysis assumes that 51 percent of riders switch to another BART access mode when their space is removed, and are therefore retained as BART riders.

Checklist



	Scenario A	Scenario B	Scenario C
Number of spaces reduced	-	301	301
Space turnover (cars parked per day)	1	1	1
Number of people per car	1.1	1.1	1.1
Number of auto access boardings reduced		331.1	331.1
Percent that find another access mode and continue to use BART	51%	51%	51%
BART boardings retained, change to another access mode	-	169	169
Net boardings loss	-	162	162
Ridership loss @ 2 trips per station boarding	0	324	324

MacArthur Change in Parking Operating Costs

Annual cost per surface space	$ 353.04
Annual cost per structure space	$ 537.62

Operating costs derived from BART Memo on parking costs dated 10/12/2000, Scott Mill author, inflated to 2004 using percentage increases of 6%, 5%, 5%, and 6%, per BART guidance 1/5/05.

	Scenario A	Scenario B	Scenario C
Existing Condition			
Number of surface spaces	603	603	603
Surface space operating costs	$ 212,883	$ 212,883	$ 212,883
Number of structure spaces	0	0	0
Structure space operating costs	$ -	$ -	$ -
Total parking operating costs	$ 212,883	$ 212,883	$ 212,883
Scenario			
Number of surface spaces	-	-	-
Surface space operating costs	$ -	$ -	$ -
Number of structure spaces	603	302	302
Structure space operating costs	$ 324,185	$ 162,361	$ 162,361
Total parking operating costs	$ 324,185	$ 162,361	$ 162,361
Change in parking operation costs	($111,302)	$50,522	$ 50,522

Impact on Costs and Revenues - MacArthur

Revenue factors

	Scenario A		Scenario B		Scenario C	
Fare revenue	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*
Ridership impact of joint development	962		962		1,636	
Ridership impact of change in pkg. supply	0		-324		-324	
Ridership impact of parking charge programs	0	0	0		0	
Ridership impact of other access programs					100	
Net change in ridership	962		638		1,411	
Average fare	$ 2.43		$ 2.43		$ 2.43	
Fare revenue		**$ 622,810**		**$ 412,759**		**$ 913,448**
Parking revenue						
Change in number of space under reserved parking	0		0		-119	
Monthly cost of reserved parking	$ 63.00		$ 63.00		$ 63.00	
Cost of collection	10%		10%		10%	
Net revenue from reserved parking		**$ -**		**$ -**		$ (80,968)
Number of spaces under paid parking	0		151		302	
Daily parking price	$ -		$ 1.00		$ 3.00	
Cost of collection	30%		30%		30%	
Annualized capital cost of parking chg. equipment	$ -		$ 3,341		$ 6,682	
Net revenue from parking charges		**$ -**		$ 24,141		$ 158,210
Combined parking revenue		**$ -**		**$ 24,141**		**$ 77,243**
Ground rent after replacement parking						
Fair market land value	$30.00		$30.00		$30.00	
Parcel size	259,200		259,200		259,200	
Land value	$ 7,776,000		$ 7,776,000		$ 7,776,000	
Replacement capital cost per space	$ 15,000		$ 15,000		$ 15,000	
Number of spaces replaced	603		301		301	
Cost of replacement parking	$ 9,045,000		$ 4,515,000		$ 4,515,000	
Residual	$ (1,269,000)		$ 3,261,000		$ 3,261,000	
Annualization factor	0.1		0.1		0.1	
Ground rent after parking costs		**$ (126,900)**		**$ 326,100**		**$ 326,100**
Grant/partnership revenue						
Amount	0		0		0	
Annualization factor	0.1		0.1		0.1	
Annualized grant/partnership revenue		$ -		$ -		$ -
Total annual revenue		**$ 495,910**		**$ 763,000**		**$ 1,316,791**

Cost factors

Change in parking operating costs						
Parking operating costs		**($111,302)**		**$ 50,522**		**$ 50,522**
BART operating costs						
Other BART costs (e.g., new service, imp. etc.)		$ -		$ -		$ -
BART participation in other access operating costs						
Amount		**$ -**		**$ -**		**$ (180,000)**
BART participation in other access capital costs						
One-time capital cost	$0		$0		($1,000,000)	
Annualization factor	0.1		0.1		0.1	
Annualized capital costs		**$0**		**$0**		**($100,000)**
Total annual cost		**$ (111,302)**		**$ 50,522**		**$ (229,478)**
Net annual impact		**$ 384,609**		**$ 813,522**		**$ 1,087,313**

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Trip Generation from San Leandro Joint Development

Scenario A

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	132	6.63	875				
Res. work trips				0.25	218.79	40.5	89
Res. non-work				0.75	656.37	8.55	56
Retail	0	58.59	0			5.85	0
Total rail trips							**145**

Scenario B

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	132	6.63	875				
Res. work trips				0.25	218.79	40.5	89
Res. non-work				0.75	656.37	8.55	56
Retail	0	58.59	0			5.85	0
Total rail trips							**145**

Scenario C

Type of development	Amount of development	Trip generation rate	Total trips	Trip split	Disaggregated trips	Percent BART capture	# of Trips
Residential	200	6.63	1,326				
Res. work trips				0.25	331.5	40.5	134
Res. non-work				0.75	994.5	8.55	85
Retail	0	58.59	0			5.85	0
Total rail trips							**219**

Notes:

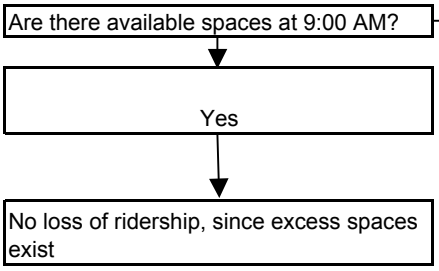
Residential trip generation from ITE 6th Edition rate for apartment
Retail trip generation from ITE 6th Edition rate for 80% specialty retail center and 20% high turnover sit down restaurant
Residential work trip share based on average of rail shares for Pleasant Hill and S. Alameda County, Table 5-8, page 46 CA TOD Report

Residential non-work trip share based on an average of rail shares for Pleasant Hill and S. Alameda County, Table 5-11, page 51 CA TOD Report
Retail rail share based on 50% of the rail share for El Cerrito Plaza, Table 7-7, page 109 CA TOD Report. Half of El Cerrito share used because small amount of retail is primarily local serving uses.

Ridership Impact from Changes in San Leandro Station Parking Supply

If the number of spaces for BART patrons are reduced, then riders may be displaced. This analysis assumes that 34 percent of riders switch to another BART access mode when their space is removed, and are therefore retained as BART riders. Note that negative number under Scenario A indicates that ridership increase because parking supply is increased.

Checklist



No	Scenario A	Scenario B	Scenario C
Number of spaces reduced (added)	(34)	34	68
Space turnover (cars parked per day)	1	1	1
Number of people per car	1.1	1.1	1.1
Number of auto access boardings reduced (added)	(37.4)	37.4	74.8
Percent that find another access mode and continue to use BART		34%	34%
BART boardings retained		13	25
Net boardings loss (gain)	(37)	25	49
Ridership loss (gain) @ 2 trips per station boarding	(75)	49	99

San Leandro Change in Parking Operating Costs

Annual cost per surface space	$ 353.04
Annual cost per structure space	$ 537.62

Operating costs derived from BART Memo on parking costs dated 10/12/2000, Scott Mill author, inflated to 2004 using percentage increases of 6%, 5%, 5%, and 6%, per BART guidance 1/5/05.

	Scenario A	Scenario B	Scenario C
Existing Condition			
Number of surface spaces	1,234	1,234	1,234
Surface space operating costs	$ 435,651	$ 435,651	$ 435,651
Number of structure spaces	0	0	0
Structure space operating costs	$ -	$ -	$ -
Total parking operating costs	$ 435,651	$ 435,651	$ 435,651
Scenario			
Number of surface spaces	893	893	893
Surface space operating costs	$ 315,265	$ 315,265	$ 315,265
Number of structure spaces	375	307	273
Structure space operating costs	$ 201,608	$ 165,049	$ 146,770
Total parking operating costs	$ 516,872	$ 480,314	$ 462,035
Change in parking operation costs	($81,221)	($44,663)	($26,384)

Impact on Costs and Revenues - San Leandro

Revenue factors

	Scenario A		Scenario B		Scenario C	
Fare revenue	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*	*Variables*	*Annual revenue*
Ridership impact of joint development	145		145		219	
Ridership impact of change in pkg. supply	75		-49		-99	
Ridership impact of parking charge programs	0	0	0			
Ridership impact of other access programs						
Net change in ridership	220		95		121	
Average fare	$ 2.64		$ 2.64		$ 2.64	
Fare revenue		**$ 154,394**		**$ 67,067**		**$ 84,783**
Parking revenue						
Change in number of space under reserved parking	0		0		0	
Monthly cost of reserved parking	$ 63.00		$ 63.00		$ 63.00	
Cost of collection	10%		10%		10%	
Net revenue from reserved parking		**$ -**		**$ -**		**$ -**
Number of spaces under paid parking	0		0		0	
Daily parking price	$ -		$ -		$ -	
Cost of collection	30%		30%		30%	
Annualized capital cost of parking chg. equipment	$ -		$ -		$ -	
Net revenue from parking charges		$ -		$ -		$ -
Combined parking revenue		**$ -**		**$ -**		**$ -**
Ground rent after replacement parking						
Fair market land value	$ 32.50		$ 32.50		$ 32.50	
Parcel size	95,832		95,832		95,832	
Land value	$ 3,114,540		$ 3,114,540		$ 3,114,540	
Replacement capital cost per space	$ 15,000		$ 15,000		$ 15,000	
Number of spaces replaced	375		307		273	
Cost of replacement parking	$ 5,625,000		$ 4,605,000		$ 4,095,000	
Residual	$ (2,510,460)		$ (1,490,460)		$ (980,460)	
Annualization factor	0.1		0.1		0.1	
Ground rent after parking costs		**($251,046)**		**($149,046)**		**($98,046)**
Grant/partnership revenue						
Amount	0		0		0	
Annualization factor	0.1		0.1		0.1	
Annualized grant/partnership revenue		$ -		$ -		$ -
Total annual revenue		**($96,652)**		**($81,979)**		**($13,263)**

Cost factors

Change in parking operating costs						
Parking operating costs		**($81,221)**		**($44,663)**		**($26,384)**
BART operating costs						
Other BART costs (e.g., new service, imp. etc.)		$ -		$ -		$ -
BART participation in other access operating costs						
Amount		**$ -**		**$ -**		**$ -**
BART participation in other access capital costs						
One-time capital cost	$ -		$ -		$0	
Annualization factor	0.1		0.1		0.1	
Annualized capital costs		**$0**		**$0**		**$0**
Total annual cost		**($81,221)**		**($44,663)**		**($26,384)**
Net annual impact		**($177,873)**		**($126,641)**		**($39,646)**