Brooklyn Basin Transportation Demand Management Plan

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1 INTRODUCTION

Purpose of the Plan

The Brooklyn Basin Project represents one of the most exciting opportunities for dense, urban development in the Bay Area, not least because of its size. This report presents the proposed Transportation Demand Management (TDM) plan for the project. It sets out a series of measures by which the developer and property manager will reduce vehicle travel to and from the site, and promote transit, walking and cycling. These measures capitalize on the mix of uses, walkability and future transit accessibility of the development, giving people a choice whether or not to use their vehicles.

At the same time, the TDM plan is designed to manage the demand for auto travel and ensure that the parking system works well, and that spaces are readily available for all users. The project is designed using "urban" parking ratios, rather than the "suburban" model of unlimited free parking. While this brings numerous advantages – increased development potential and reduced auto use, to name just two – it also requires careful management of the parking system and the provision of alternatives to the auto. The analysis is intended to provide assurances to the developer, lenders, the City and the public that the transportation system will be sufficient to meet the needs of residents, employees, visitors and recreational users.

In summary, the plan concludes that a comprehensive transportation demand management plan can reduce auto trips to and from the site, improve the accessibility of the site to all users and ensure that all modes of transportation including the parking system function well. The basic building blocks of the transportation demand management plan are summarized in Figure 1-1.

Measures Included in the Plan

Chapter 2 proposes transit improvements to serve the site. Chapter 3 describes the proposed facilities for bicyclists, while Chapter 4 details a recommended parking management plan.

The full set of recommended measures is shown Figure 1-1. Many of these measures, particularly the bicycle facilities, have already been incorporated into the project design from an early stage. The table divides the measures into required mitigations, which are considered essential for the project's success, and recommended actions.

Figure 1-1 Summary of Planned TDM Measures

Program Elements	Implementation
Coordination	
TDM Coordination	The Brooklyn Basin property manager will be responsible for implementing the strategies in this plan.
Transit	
Brooklyn Basin Shuttle	There will be frequent, direct weekday shuttle service between Brooklyn Basin and BART, This service could be operated by a private contractor or by AC Transit. Several potential operating models are discussed in this plan document. The preferred option is an extension of the Free B shuttle service to downtown Oakland. If extension of the Free B proves infeasible at the time of implementation, the second option is extension of AC Transit's Route 1 from downtown Oakland to Brooklyn Basin. If an agreement with AC Transit cannot be reached, the third option would be a privately operated shuttle.
Other AC Transit service	The developer and property manager will work with AC Transit staff to encourage AC to serve the site with one or more frequent routes. Potential service options include re-routing AC Transits Route 1 or extending Route 72 to serve Brooklyn Basin.
Bicycle Access	
Bicycle network	The development will have a full pedestrian and bicycle network, which will be integrated into the City of Oakland's network, and which will include the proposed Bay Trail connection.
Bicycle parking	The development will provide secure and on-street bicycle parking as outlined in the development plan.
Bikesharing	The Brooklyn Basin property manager will work with the City of Oakland to advocate for bike share bikeshare stations at the development in case of future expansion of Bay Area Bike Share.
Wayfinding and lighting	The developer will provide consistent bicycle, pedestrian, transit rider, and vehicle wayfinding and lighting throughout Brooklyn Basin. All bicycle wayfinding will be consistent with City of Oakland and Bay Trail guidelines and standards.
Parking Management	
Shared commercial parking	Commercial uses will rely on a shared pool of parking.
Unbundled residential parking	Residential parking will be leased to residents. Parking prices will be varied by location as appropriate. If residential units are sold in the future, parking spaces should be maintained as a leased amenity.
Metered on-street parking	On-street parking would be priced using demand-responsive methodology. Note that this measure requires approval and coordination from the City of Oakland.
Carsharing	The Brooklyn Basin property manager will work with providers to encourage them to provide car share vehicles located at the development.

Ferry	
Ferry	If WETA wishes to provide ferry service to the site in the future, work with them to provide terminal space, access, and wayfinding.

TDM Coordination

The property manager will coordinate and implement the various elements of this plan. The following is a summary of the potential TDM activities of the property management office. Additional details are provided in the remaining sections of the plan. Activities may include:

Manage Parking Operations. The property manager will manage operations for off –street parking and the parking operations on site. Activities may include:

- Selling parking permits and allocating spaces
- Overseeing parking administration, enforcement and maintenance
- Monitoring parking occupancy
- Recommending parking price adjustments
- Marketing the car-share program
- Special event planning

- **Provide Transit information to residents, workers, and visitors.** While transit information is widely available through other sources (such as the 511 website and telephone service), a consolidated local source will help newcomers orient to available transit services, and will encourage them to try transit for the first time. Details of transit connections to and from the site may also be provided to prospective residents and included in a "welcome packet" for new homeowners and renters on site.
- **Manage Transit:** The property manager may also be responsible for managing the shuttle, should it be contracted with a private operator.
- **Providing bicycling information:** The property manager will allocate bicycle cage spaces and lockers, issue keys, distribute bicycle maps, and monitoring bicycle rack usage and the need for more racks.
- **Conduct outreach to commercial tenants.** The property manager will be responsible for the outreach activities required by the development's conditions of approval. Activities may include:
  - Encouraging commercial tenants to implement employee rideshare incentive programs.
  - Encouraging commercial tenants to meet standard, minimum employee ridesharing requirements or to provide incentives to encourage employees to rideshare.
  - Encouraging commercial tenants to implement a parking cash-out program for employees (e.g., non-driving employees receive transportation allowance equivalent to the value of subsidized parking).
  - Publicizing City, County or regional programs such as 511 and the car- pooling matching database

  - Distribute information about the Alameda County Congestion Management Agency's Guaranteed Ride Home Program to tenants of the building to facilitate non-auto travel modes.

- **Communicate with the City and the public.** The property manager will liaise with City transportation staff and respond to questions or complaints from the public. The property manager will conduct transit ridership surveys annually and provide findings to the City of Oakland Transportation Services Manager or relevant party. The report will also include readily available information regarding the operations and effectiveness of TDM programs".

2 TRANSIT

At present, the Brooklyn Basin development area does not have transit service. As Brooklyn Basin is built out, transit service will also be required to serve the needs of residents and visitors to the area. For residents, transit service must connect to local and regional transit networks and job centers, as well as provide a way for residents to make local and regional non-work trips (e.g., shopping, educational, or recreational). Transit service also needs to provide a way for non-residents to access Brooklyn Basin's employment, retail, and recreational opportunities.

Initially, there will be relatively low demand for transit service. It is important, however, for transit service to be available from the time the first residents are in place, to encourage a culture of transit riding on the site. The amount that transit service reduces vehicle demand depends upon its frequency, span (hours of operation), and usefulness – its speed, cost, convenience, and how well it connects people to other transit service and key destinations.

Important transit linkages include:

- *Connections with downtown Oakland, including BART's 12th Street City Center Station.* Demand for travel to these destinations will include commuters, and trips for a full range of trip purposes in downtown Oakland. This primary service should operate at least five days per week, providing fast and frequent service for residents accessing transportation connections and services downtown, and also for connecting visitors to the site.
- *Connections to the Lake Merritt BART station.* A connection to Lake Merritt BART would provide the fastest possible access to the regional transit system.
- *Connections with Jack London Square, the retail and entertainment center closest to Brooklyn Basin.* Residents will need access to goods and services at Jack London, while visitors may want to "make a day" of a trip to both locations. A connection between Jack London and the site could also provide connections to the Aquatic Center, the Ferry Terminal, and to Amtrak, all within reasonable walking distance.
- *Connections from residential areas to the east of Brooklyn Basin.* Transit connections to east Oakland are desired primarily to provide access from residential areas to the open space and retail amenities in Brooklyn Basin.

As part of this TDM plan, Brooklyn Basin intends prioritize a fast, frequent transit connection providing service to either Lake Merritt BART Station or 12th Street Civic Center BART Station in downtown Oakland. Service could be privately contracted, or operated by AC Transit, depending on circumstances at the time of implementation. Brooklyn Basin also strongly encourages AC Transit to extend one or more routes to the area of the development to provide connectivity to Jack London Square, downtown Oakland, Lake Merritt BART station and/or points east. These strategies are described in more detail below.

The developer will also construct transit facilities, such as bus turnouts/bus bulbs, benches, shelters, etc., as necessary to accommodate the transit service described in this section.

Brooklyn Basin Shuttle

Brooklyn Basin will either provide or work with local partners to provide frequent transit service from Brooklyn Basin to one of the two nearby BART Stations. Irrespective of the service provider or the contracting arrangement, the characteristics of the service will be as follows:

- **Service level:** the minimum level of service will be weekday, peak hour service only, to be in place by the issuance of the 1,000th certificate of occupancy. The targeted level of service is every 15 minutes during peak commute periods and every 30 minutes during non-commute periods between 6 AM and 8 PM, Monday through Friday, from the issuance of the 1st certificate of occupancy. When demand warrants, off-peak service will be increased in frequency to every 15-mintes.
- **Vehicle requirements:** Buses will accommodate at least 16 seated passengers, and will be fully accessible to passengers using wheelchairs and other mobility devices. Buses will be targeted to have the capacity to transport bicycles.
- **Stop Amenities:** For stops located on the Brooklyn Basin site, the developer will provide signage showing the route and schedule of the bus, as well as a shelter and waiting area. Real-time arrival information will be provided at major bus stops on-site. A private shuttle (if used) will have real-time arrival information available through mobile devices (as is currently provided for the Free B).
- **Route:** The shuttle service will be designed to provide a high quality connection between the development and a BART station. As illustrated in Figure 2-1, shuttle service would operate on one of two routes, at the discretion of the developer and property manager:
    - From 9th Street in Brooklyn Basin along to Jack London Square, and then continuing on Broadway to the 12th Street BART station. Key stops along this route would be at the Aquatic Center, 5th Avenue, Main Street and Embarcadero, Main and 9th Avenue and 9th at Embarcadero in addition to existing AC Transit stops along Broadway to the 12th Street BART station. This route will be selected if it proves feasible to enter into a cost-sharing agreement with either the City of Oakland's Free B operation or AC Transit.
    - From 9th Street in Brooklyn Basin directly to Lake Merritt BART station. Key stops along this route could be at Main and Embarcadero, and 5th and Embarcadero.

A diagram illustrating potential shuttle routes is provided in Figure 2-1. While either of these routes provides connectivity to BART as required by the developer's conditions of approval, Option 1 would provide more direct connections to AMTRAK and the Capitol Corridor, Oakland's ferry services and downtown Oakland with both BART and significant AC Transit service. Because this route is longer and much of it duplicates existing Free B and AC Transit routes, this extension will be possible only if a cooperative agreement can be reached with the primary operator of those services.

Preferred Option: Partner to Extend the City of Oakland's 'Free B' shuttle

If possible at the time of implementation, Brooklyn Basin may choose to partner with the City of Oakland to extend the 'Free B' Shuttle to Brooklyn Basin.

The Free B, which is specially branded and free to customers but operating under contract by AC Transit, connects 19th Street and 12th Street BART Stations in Downtown Oakland to Jack London Square via Broadway. It currently operates every 10 minutes during peak periods and every 15 minutes during off-peak periods. The current span of service is 7 AM to 7 PM, Monday to Thursday, 7 AM to 1 AM on Friday, and Saturday 6 PM to 1 AM. The Free B is the preferred option for the following reasons:

- The ease and cost effectiveness of adding to existing bus infrastructure.
- The quality of buses and value of its "brand".
- The role its "brand" plays in encouraging ridership from Brooklyn Basin residents.

Key features of the extension would be as follows:

- ***Route:*** As shown in Figure 2-1, this option would involve extending the service from its current terminus at Webster Street to a new terminus at 9th Avenue. The round-trip route would be roughly 2 miles longer than the current route.
- ***Service levels:*** Weekday service would run from 6 AM to 8 PM on weekdays, requiring two additional hours of service in addition to what is currently provided by the Free B. Current peak (10 minute) and off-peak (15 minute) frequency levels would be maintained. Service will be scaled up through either a larger vehicle or more frequent service when any bus is at service capacity service.
- ***Space Requirements:*** The extension would require space to lay-over at least one 30-foot vehicle at or near the route's terminus.
- ***Cost:*** Modifying the current Free B shuttle's weekday service plan to serve Brooklyn Basin would require placing one additional vehicle on the route during current service hours and three additional vehicles on the route from 6 AM to 7, Monday through Friday. The cost-sharing arrangement would have to be negotiated with the City of Oakland and AC Transit at the time of implementation.

Note that the City of Oakland is currently studying options to replace the Free B with a new service, called the Broadway Circulator, which would provide a longer span of service and connect to other destinations north of downtown Oakland, such as Macarthur or Rockridge BART Stations. Alternatives under consideration include both bus and streetcar options. Generally, options to extend a future Circulator to Brooklyn Basin would have roughly the same costs and other considerations as a Free B extension. The cost ranges estimated for the Free B would apply. However, there are the following key differences:

- If the Circulator were implemented as a streetcar, it could not be extended to Brooklyn Basin. Other options would have to be explored, including an independently contracted shuttle or the extension of an AC Transit route to Brooklyn Basin.
- While the current 'B' service is free, it is likely that the Circulator would require passengers to pay a fare.

At the time of implementation, the property manager will consider recent or pending changes to the Free B service before choosing a transit service option for the site.

Alternate/Option 2: Extend AC Transit Route 1

While an extension of the Free B is the preferred option to serve Brooklyn Basin, if it proves infeasible, the property manager would consider entering an arrangement with AC Transit to provide for extending AC Transit Route 1 after it is severed from the southern (International Boulevard) segment in downtown Oakland.

Today, this route begins in Downtown Berkeley and serves the Telegraph Avenue corridor between Berkeley and downtown Oakland. South of downtown Oakland, it proceeds along International Boulevard to San Leandro and Bay Fair BART stations. However, a separate bus rapid transit (BRT) service is planned for International Boulevard, and Route 1 will no longer serve this corridor after BRT implementation. At this time, Route 1 could instead be re-routed to serve Brooklyn Basin.

Specific service levels, operational details, and cost sharing arrangement would be agreed with AC Transit at the time of implementation, but is proposed to be 6 AM to 8 PM, every 10 minutes. Potential routing is illustrated in Figure 2-1.

Alternate/Option 3: Independently Contract a New Shuttle Service to Lake Merritt BART Station

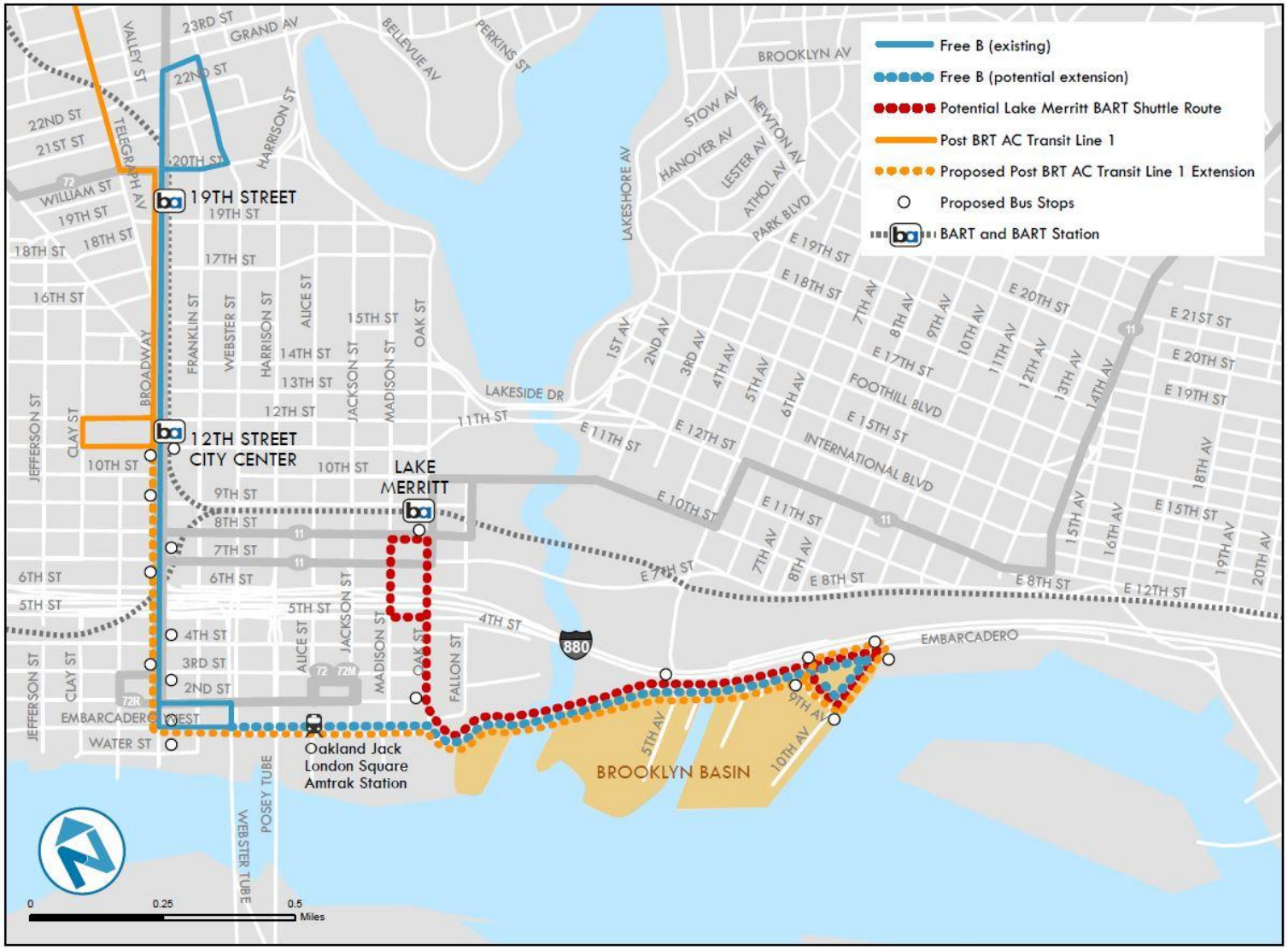
If partnering with either the City of Oakland or AC Transit is not an option, Brooklyn Basin may independently contract with a private transit operator to provide shuttle service to Lake Merritt BART Station. Features would be as follows:

As shown in Figure 2-1, an independent shuttle would operate between Lake Merritt BART station and 9th Avenue in Brooklyn Basin. The total round-trip route would be roughly 2.8 miles.

The minimum level of service would be weekday, peak hour service only. The targeted level of service would be weekday service between 6 AM and 8 PM, every 15 minutes during peak commute periods and every 30 minutes during off-peak periods. Service would be scaled up to every 15 minutes all day as demand warrants.

Like the Free B extension, the independent shuttle would require space to lay-over up to three cut-away vehicles at or near the route's terminus.

Figure 2-1 Brooklyn Basin Potential Shuttle Services



3 BICYCLE NETWORK

Bicycle facilities are a critical part of the Brooklyn Basin Project. They will allow easy access for residents and visitors to and from nearby destinations and transit hubs, particularly Jack London Square, downtown Oakland and Lake Merritt BART station. These are all between one and two miles from the project site – a long walk, but a brief bicycle ride. In turn, bicycle facilities will help to reduce parking demand and traffic impacts from the development.

At the same time, provision of bicycle facilities can help the wider community take advantage of the recreational opportunities that redevelopment will bring. The San Francisco Bay Trail runs through the project site, and many trail users will enjoy the facility by bicycle.

This chapter of the Transportation Demand Management Plan discusses how bicycle facilities will be integrated into the Brooklyn Basin Project. The first section outlines the proposed bikeway network, including the Bay Trail and links to the City of Oakland network. The second section covers bicycle parking facilities.

BIKEWAYS

Bikeway Network

The developer will provide bicycle lanes and paths, connected to the community-wide network. These paths, described below, will provide direct, safe, attractive pedestrian and bicycle access to transit stops and adjacent development. In addition, the developer will provide adequate street lighting within the street right of way immediately adjacent to and within the project site.

Bikeways must meet the design standards specified in Chapter 1000 of the Caltrans Highway Design Manual. In this chapter, three types of bikeways, are defined:

- Class I Bike Path. Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross- flow minimized.
- Class II Bike Lane. Provides a striped lane for one-way bike travel on a street or highway.
- Class III Bike Route. Provides for shared use with pedestrian or motor vehicle traffic.

At the Brooklyn Basin Project, Class I bike paths will primarily provide for recreational use. The path will follow the shoreline, as part of the Bay Trail. Class II bike lanes, meanwhile, will provide a higher-speed, direct route along the Embarcadero. Fifth Avenue, Main Street and Eighth Avenue will carry some bicycle traffic, and should be treated as Class III bicycle routes, although need not be signed.

The existing and planned bikeway network is shown in Figure 3-1. Along the Embarcadero, 6' wide Class II bicycle lanes have been implemented and provide the most direct route past the project site. For recreational users or less experienced cyclists, a proposed Class I Bike Path will follow the shoreline, as follows:

- From Fourth Avenue to Clinton Basin, this will provide a 40' section, including a 10-12' bike path separated from the pedestrian path (Figure 3-2).
- Around Clinton Basin, there will be a 35' Promenade Zone, shared between pedestrians and bicycles, stepped down from a 15' Cafe Zone (Figure 3-3).
- Along Ninth Avenue and along Fourth Avenue, the Bay Trail will split into separate bicycle and pedestrian sections. The pedestrian route will hug the shoreline, while the bicycle path (Figure 3-4) will follow the roadway.

Main Street will also be an important access route to the project site, particularly for more experienced cyclists.

Figure 3-1 Existing and Planned Bikeway Network

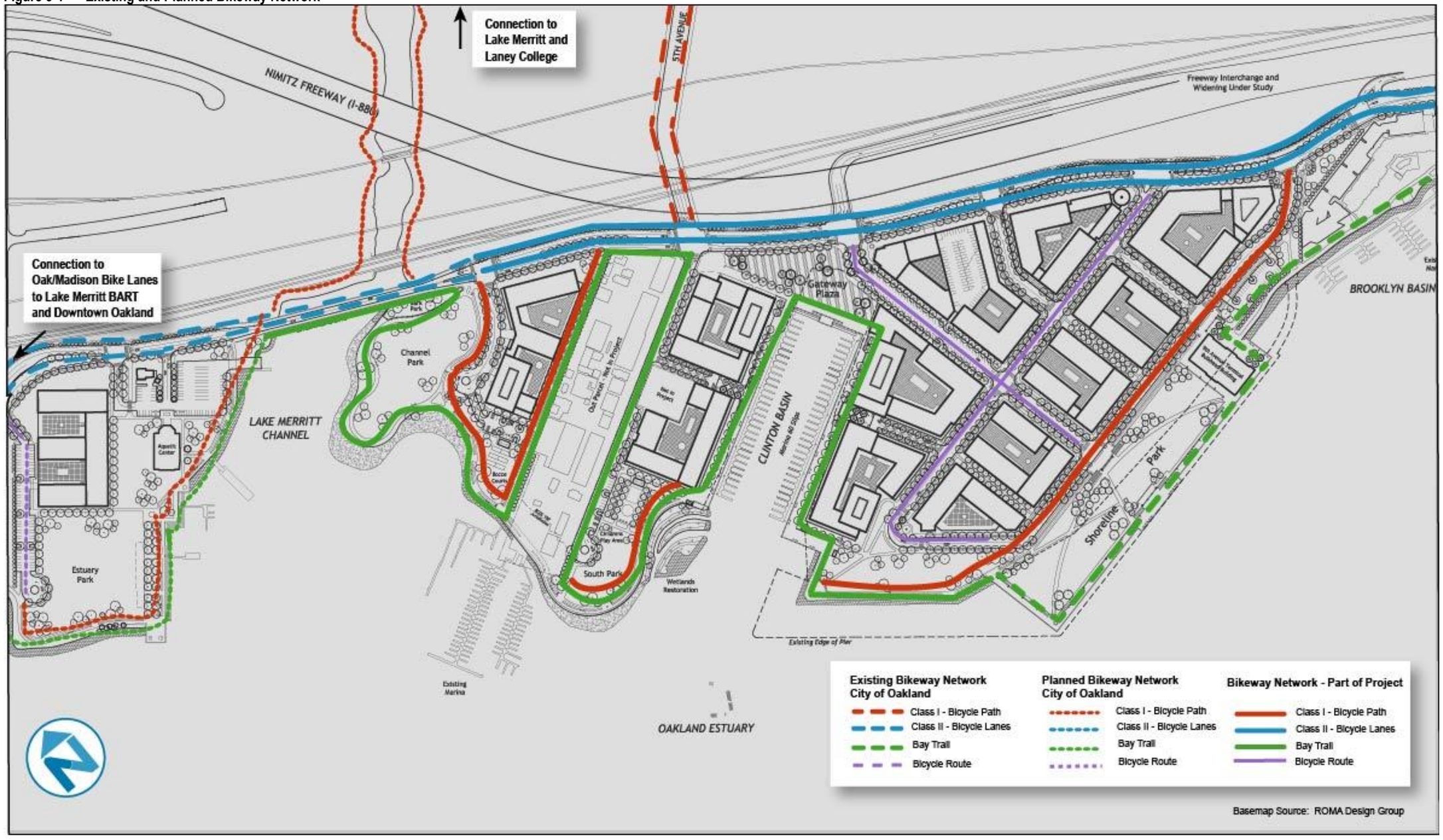
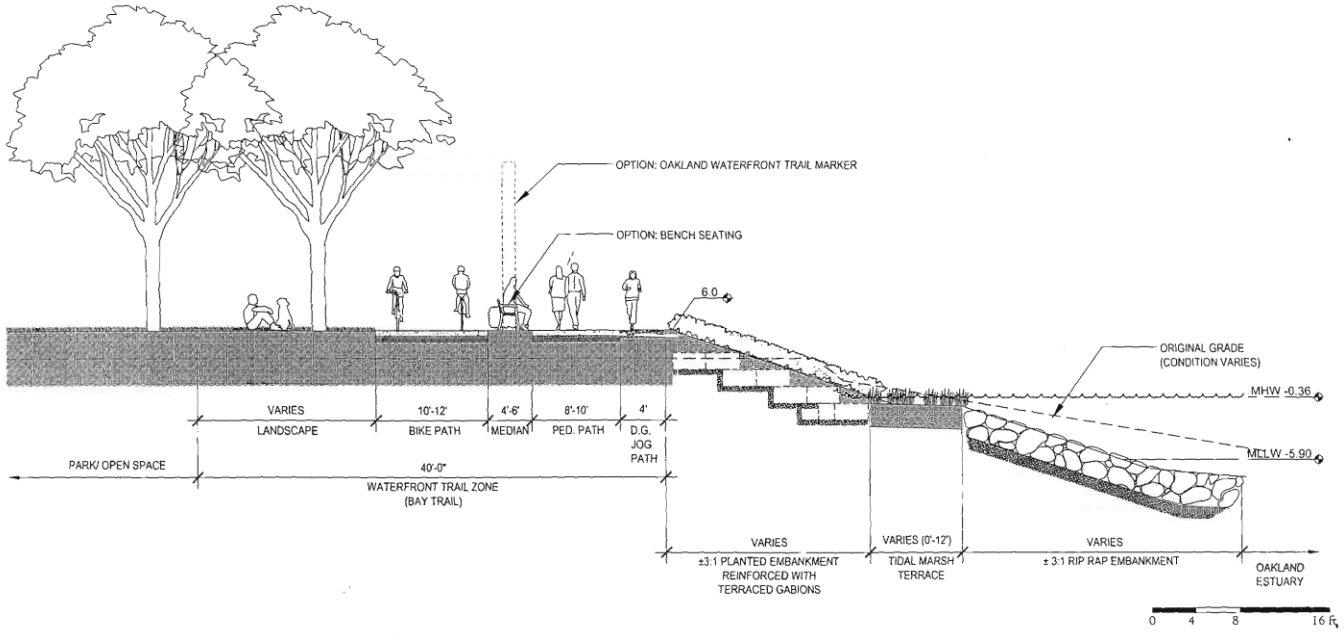
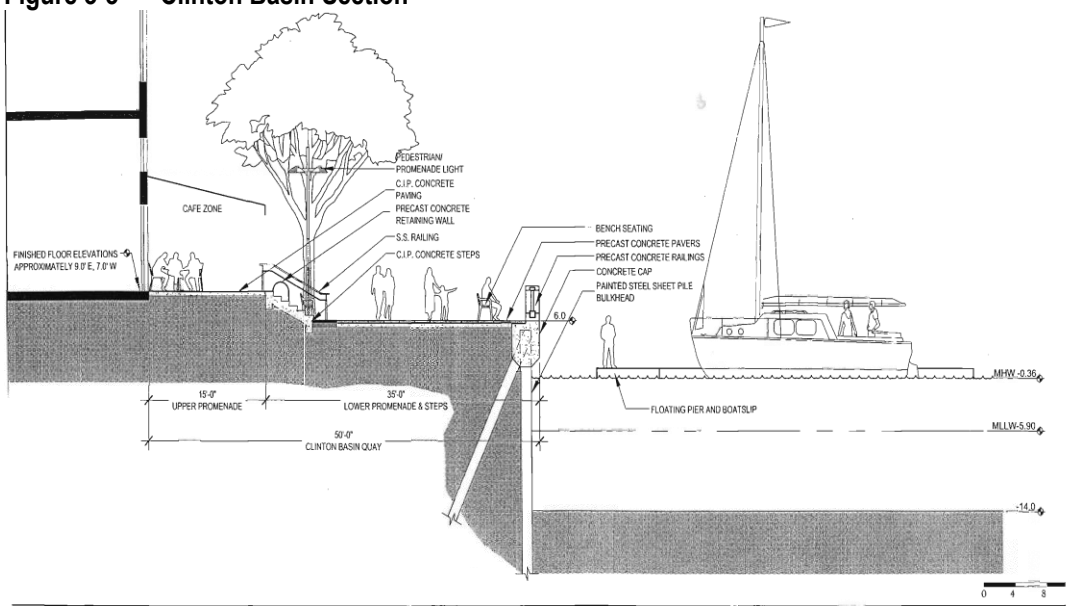


Figure 3-2 Typical Bay Trail Section



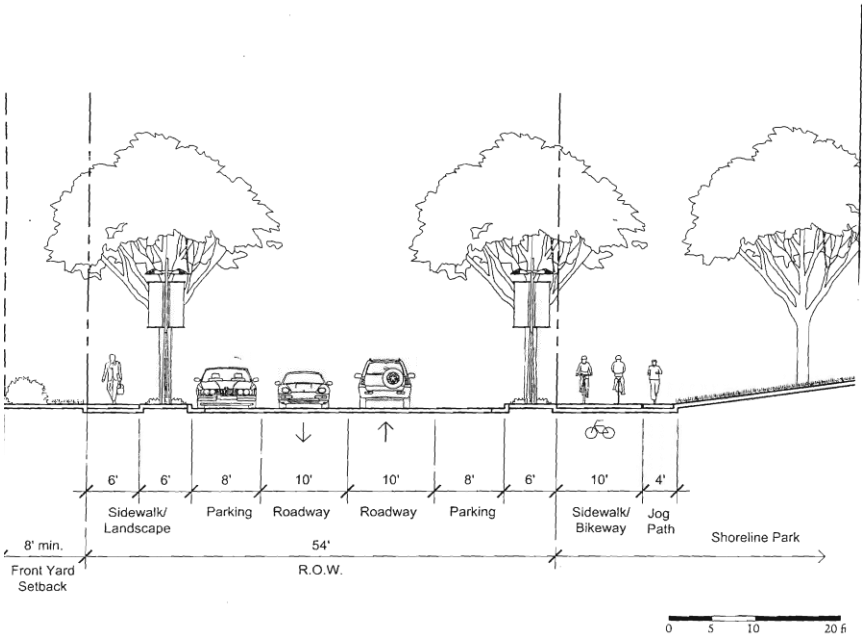
Source: Prepared by ROMA Design Group in association with MVE Architects, Moffatt & Nichol and BKF Engineers

Figure 3-3 Clinton Basin Section



Source: Prepared by ROMA Design Group in association with MVE Architects, Moffatt & Nichol and BKF Engineers

Figure 3-4 Ninth Avenue Section



Source: Prepared by ROMA Design Group in association with MVE Architects, Moffatt & Nichol and BKF Engineers

Bay Trail

In addition to Caltrans Highway Design Standards for bikeways, the San Francisco Bay Trail Plan sets out trail alignment and design policies in order to ensure high-quality public access to pedestrians and bicycles as close to the shoreline as possible. The Brooklyn Basin Project will implement the Bay Trail according to these policies through the project site, as shown in Figure 3-5 and Figure 3-6.

Figure 3-5 Relevant Bay Trail Alignment and Design Policies

Policy	Implementation
Trail Alignment Policies	
Ensure a feasible, continuous trail around the Bay.	The trail will be continuous through the project site.
Locate trail, where feasible, close to the shoreline.	The trail will follow the shoreline through the project site.
In selecting a trail alignment, use existing stream, creek, slough and river crossings where they are available. This may require bridge widenings in some locations.	The trail will cross Lake Merritt Channel via the existing Embarcadero bridge.
In order to minimize the use of existing staging areas along the shoreline and to reduce the need for additional staging areas, the choice of trail alignment should take full advantage of available transit, including rail service (e.g. Caltrain, BART), ferries and bus service.	The trail can be accessed by a bike path from Lake Merritt BART station, and by planned new AC Transit and shuttle service.
Trail Design Policies	
Provide access wherever feasible to the greatest range of trail users on each segment.	The trail will be fully accessible through the project site.
Wherever possible, new trails should be physically separated from streets and roadways to ensure the safety of trail users.	The trail will be fully separated from roadways through the project site (Class I facility). However, the trail will use the Embarcadero bridge to cross Lake Merritt Channel.
Create a trail that is as wide as necessary to accommodate safely the intended use, with separate alignments, where feasible, to provide alter- native experiences.	Bay Trail design standards will be adhered to within the project site (Figure 3-6). The north part of the site will offer several different alignments through Channel Park and South Park.
Highlight the interpretive potential of certain trail segments, including opportunities for interpretation, education, rest, and view enjoyment.	Benches, cafes and other amenities will be provided throughout the project site.
Incorporate necessary support facilities, using existing parks, parking lots, and other staging areas wherever possible.	Through shared parking, the project will minimize the need to construct dedicated parking facilities for Bay Trail users.
Design new segments of trail to meet the highest practical standards and regulations, depending on the nature and intensity of anticipated use, terrain, existing regulations, and standards on existing portions of the trail.	Design standards for both the Bay Trail and City of Oakland will be adhered to.

Policy	Implementation
Minimum and maximum standards by use, width, surface, etc. should be developed, to ensure safe enjoyment of the trail and compatibility with surroundings and existing facilities, and to encourage use and design of surfaces for which long-term maintenance will be cost-effective.	Bay Trail design standards will be adhered to within the project site (Figure 3-6).
Design and route the trail to discourage use of undesignated trails.	In general, the alignment will provide the most direct route along the shoreline.

Figure 3-6 Bay Trail Design Guidelines

Item	High-Use Facilities (Separate Paths)	Multi-Use Paths	Bicycle-Only Paths
Minimum width (one-way)	8-10'	10'	8'
Minimum width (two-way)	10-12'	10-12'	10-12'
Surface	Asphalt	Asphalt	Asphalt
Horizontal clearance (incl. shoulders)	12-16'	14-16'	10'
Shoulder	2'	2'	2'
Vertical clearance	10'	10'	10'
Cross slope	2% max	2% max	2% max
Maximum grades[1]	5%	5%	5%

Bicycle Access

There are three major access routes to the project site for bicyclists, shown in Figure 3-7:

- Embarcadero: Bicycle lanes have been implemented on Embarcadero, providing a key connection to the site by linking to Jack London Square and the Amtrak station to the northwest, and to the Oak/Madison bicycle lanes which provide access to Lake Merritt BART station and downtown Oakland.
- 5th Avenue: Bicycle lanes have been implemented on 5th Avenue from Embarcadero to 10th Street.
- Lake Merritt Channel Pathway: a planned multi-use bicycle and pedestrian path linking to Laney College and Lake Merritt, and a planned east-west Class I bicycle path along the Union Pacific right-of-way

Note that Lake Merritt Channel Pathway is identified in the City of Oakland bicycle plan and as such would not be implemented as part of the Brooklyn Basin project.

[1] Percentage grade for short distances with flat rest areas at turn outs, except where site conditions require a greater slope for short distance.

Slight modifications to several proposed intersection designs are recommended to provide good connections from the project site to these access routes.

Figure 3-7 Bikeway Connections

WAYFINDING

Wayfinding signage will be provided along the length of the Bay Trail within the project site. This signage will help visitors to locate the trail once they arrive at the site, and also to stay on the trail. Gateway signage will be provided at every intersection with the Embarcadero, although the most important locations are:

- **Gateway Park.** This will be the primary point of access for many visitors, since it is adjacent to the freeway off-ramp. The park is also directly across the street from the proposed overflow parking facility under the freeway, which will primarily be utilized on sunny summer weekends. As well as signage, there will be a direct line-of-sight connection to the Bay Trail and the cafes around Clinton Basin, which will help to draw visitors in.
- **Channel Park.** This marks the western entrance to the Bay Trail; good signage here is important in drawing pedestrians and cyclists off the Embarcadero and down to the waterfront.
- **Ninth Avenue.** In a similar way to Channel Park, Ninth Avenue marks the eastern entrance; good signage will help to draw pedestrians and cyclists off the Embarcadero.

Secondary markers such as a map kiosk, light marker or interpretive signage marker will be provided at regular intervals along the trail, where there is a choice of paths. This will comply with Bay Trail policies, which state:

A consistent signing program should be established throughout the trail system, using a Bay Trail logo which will identify trails within the Bay Trail system as distinct from other connecting trails. The choice of materials used should be the concern of the individual implementing jurisdictions and agencies.

BICYCLE PARKING

Bicycle parking on the project site serves two important markets.

- Long-Term parking is needed for bicycle storage for residents and employees. This parking will be in secure, weather-protected, restricted access facilities (Class I parking).
- Short-Term parking will serve shoppers, trail users and other visitors (Class II parking). As well as security, convenient locations are a priority – otherwise, bicyclists will tend to lock their bicycles to poles or fences close to their final destination.

Long-Term Parking

A mix of long-term bicycle parking facilities is recommended in each parking garage.

- Bicycle racks at garage entrance. These will primarily serve employees, and are particularly important on Parcel G which will be a staffed garage. Here, racks should be located in clear view of the garage attendant, and may replace one or more vehicle parking spaces. In other garages, racks can make use of nooks and corners that are too small for a vehicle parking stall, provided that these are close to the entrance and have adequate visibility.

- Bicycle cages are needed in all garages, and will primarily serve residents. The cage will be secured with a locked gate (ideally using an electronic keycard). Within the cage, cyclists will be able to lock their bicycles to a rack, providing an additional level of security.
- Bicycle lockers will provide an additional option for the most security-conscious bicycle users (both residents and employees). Since they are more space-intensive than other options, they should be made available for a modest fee. A small number of lockers can be introduced initially, with the demand being closely monitored.

The parking garage is the most suitable location, as bicyclists can use the vehicle entry without the need to navigate stairs or elevators. Bicycle parking should be on the ground floor, as close to the entry as possible.

Keys or access cards would be managed by the on-site property management office. The property manager would also need to monitor the cages and racks regularly, for example to identify and remove abandoned bicycles and assess security.

Figure 3-8 shows the number of long-term caged bicycle parking spaces that are recommended initially. However, these will need to be adjusted in line with demand; should a cage fill up or lockers be oversubscribed, additional parking must be provided, even if this replaces a vehicle parking space. The initial parking requirements are set to meet the City of Oakland Zoning Code requirements, however new bicycle parking can be added if demand outstrips supply. They are calculated as follows:

- The City of Oakland zoning code calls for one long-term space per four units.
- Bicycle parking provision for Phase II should be readjusted based on experience in Phase I.
- Any parcel that includes senior housing could include a lower number of cages.

Employee demand will be greatest on parcels "G" and "H", where secure racks will be available within sight of the Parcel G garage attendant. On other parcels, employee bicycle parking demand is likely to be minimal and can be catered for with the racks located in nooks and corners, with lockers available as required.

A typical cage can be sized at slightly less than one vehicle parking stall (i.e. 9' by 16'). This cage would accommodate 4 to 5 racks holding 8 to 10 bicycles[2]. Any cage that is larger than ten bicycles poses a security risk due to the number of key holders.

[2] This sizing accommodates the dimensions recommended by the Association of Pedestrian and Bicycle Professionals. There would be two rows of three parallel racks with the middle rack in one row to provide access from the 9" side of the cage. Each row would be 6' wide with a 4' aisle in between. The racks would be spaced at 2.5' intervals, with 2' clearance to the wall.

Figure 3-8 Initial Long-Term Bicycle Parking Provision

Parcel	Number of Units	Baseline Number of Spaces	Initial Cages Recommended[3]
A	375	94	12
B	160	40	5
C	160	40	5
D	160	40	5
E	86	22	3
F	164	41	5
G	280	70	9
H	335	84	10
J	292	73	9
K	310	78	10
L	144	36	5
M	334	84	10
N	300	75	9
Total	**3,100**	**775**	**97**

Short-Term Parking

Short-term parking will be provided by means of on-street racks immediately adjacent to high-demand locations, in the following locations:

- On all retail frontages
- Around Clinton Basin
- Next to the primary transit stops; this will allow cyclists to park their bicycle should the on-bus racks be full
- In other locations, where the presence of bicycles locked to fences or railing indicates demand

Initially, a single "U" or similar rack should be placed as close as possible to the entrance of all retail businesses where this is not prevented by other obstructions. Additional racks are easy to install and this should be done based on demand. The on-site property management office will need to conduct regular observations.

Figure 3-9 shows the number of short-term bicycle parking spaces that are recommended. The initial parking requirements are set to meet the City of Oakland Zoning Code requirements, however new bicycle parking can be added if demand outstrips supply. They are calculated as follows:

[3] Each cage measures at least 9' by 16', and holds 4 racks or 8 bicycles. Most cages will replace a single vehicular parking space.

- The City of Oakland zoning code requires:
  - 1 short-term space per 20 units for multi-family housing without a private garage
  - 1 short-term space per 5,000 square feet of general retail sales
  - No short-term bicycle parking is required for the marina
- Bicycle parking provision for Phase II should be readjusted based on experience in Phase I.
- Any parcel that includes senior housing could include a lower number of bicycle racks.

Figure 3-9 Initial Short-Term Bicycle Parking Provision

Parcel	Number of Units	Retail Square Footage	Residential Short-term Parking Spaces	Retail Short-term Parking Spaces	Total
A	375	10,000	19	2	21
B	160	6,000	8	1	9
C	160	6,000	8	1	9
D	160	6,000	8	1	9
E	86	8,000	4	2	6
F	164	5,000	8	1	9
G	280	42,000	14	8	22
H	335	35,000	17	7	24
J	292	12,000	15	2	17
K	310	17,000	16	3	19
L	144	15,000	7	3	10
M	334	5,000	17	1	18
N	300	15,000	15	3	18
Total	**3,100**	**182,000**	**156**	**35**	**191**

The street furniture zone will generally be the most appropriate place for racks, where they can be placed in between street trees and lights. This maintains the maximum clear width for pedestrians. The City of Oakland has developed detailed standards for rack placement, as follows:

- **Measurements**
  - Footprint: 6’ long x 2½’ wide (the “foot- print” is the area occupied by a bicycle when it is parked at the rack)
  - Rack: 36” tall x 21” wide
- **Location Details**
  - Commercial district
  - On public property
  - With business owner’s permission

  - On a flat concrete sidewalk
  - Sidewalk must be free from cracks or other damage
- **Clearance**
  - There should be a minimum of 5½' clear for pedestrian right-of-way outside the footprint; 7' in areas of heavy pedestrian traffic. Rack should be located a minimum of:
    - 5' from Fire Hydrant
    - 4' from AC Transit Red Zone, Loading Zone, Blue Zone (disabled parking), Curb/Curb ramps, Crosswalk or BART entrance
    - 3' from Newspaper Racks, US Mailbox, Light Pole, Sign Pole, Bus Shelter, Drive-way, Surface Hardware (PG&E, Cable grates, etc.), Street Furniture, Standpipes, Bus Benches, Trash Cans, or other side- walk obstructions
    - 30" from light pole
    - 18" from the curb

BIKESHARING

The Bay Area Bike Share is a bike sharing system that currently has 700 bikes placed at 70 stations across the region, with locations currently in San Francisco, Redwood City, Mountain View, Palo Alto, and San Jose. Bikes can be rented from and returned to any station in the system, creating a network with a variety of origins and destinations. MTC has allocated $8.7 million to begin implementation of Bay Area Bike Share in Oakland, Berkeley, and Emeryville. Service is expected to begin in 2016.

As a population and activity center within comfortable biking distance of major destinations and transit hubs, Brooklyn Basin is an ideal location for bike sharing. To facilitate bicycle acess to Brooklyn Basin, the developer and property manager will:

- Work with the City of Oakland to advocate for stations at the development during future expansion of Bay Area Bike Share.
- Make space available for a bike sharing station at one or more locations within the development.

4 PARKING

INTRODUCTION

This chapter presents Nelson\Nygaard's parking analysis for the planned Brooklyn Basin development. It covers two areas:

- Quantification of parking demand
- Discussion of parking management arrangements

Effective parking management and a correctly sized supply are extremely important if the potential of this development is to be fully realized. The strategies presented in this chapter will ensure that the parking system works well, and that spaces are readily available for all users at all times.

This Transportation Demand Management (TDM) plan provides a detailed parking demand analysis; it takes into account surplus/deficits in each parcel and also includes the impacts of unbundling residential parking costs, which will be a very important tool to reduce parking demand. Typically, when a residential unit is bought or rented, the costs of providing parking are included in the price or the rent. At Brooklyn Basin, this Plan proposes that residents will be able to choose how many parking spaces they need, and will be charged for these costs separately – providing a financial incentive to own fewer cars, and to take advantage of alternatives such as carsharing. Residents who do not park in the structures would benefit from lower housing prices or rents. Of course, this calls for on-street parking management and pricing, to avoid congesting on-street parking.

Parking demand will also to a great extent depend on how the development is marketed and presented to the public, due to a "self-selection" process. A marketing message that stresses the availability of good regional transit connections, the mix of uses and the availability of carsharing (if provided) is likely to disproportionately attract households who want the choice to own just one vehicle – or in some cases none at all.

The strategies outlined here also analyze parking demand in two phases; Phase I which includes construction of Parcels A, B, C, G and F; and project build-out.

Since there are very few similar developments that can be used as a model to estimate travel behavior and thus parking demand, it is difficult to provide precise estimates of parking demand with a high degree of certainty. Parking supply ratios can thus be more generous in early phases, taking account of the fact that parking demand will be higher in earlier phases until the mix of uses matures and future transit services begin. In later phases of development, the supply of parking can reflect both this initial surplus and the actual level of demand.

Summary of Results

The analysis in this chapter shows that parking supply will be adequate to meet demand, provided that residential parking is charged for and shared between different users. The peak time of demand is expected to be weekday evenings, meaning that parking will be available on weekends for Bay Trail users and other recreational visitors. It is estimated that there will be almost 130 on-street parking spaces available on Saturday afternoons. Figure 4-1 shows the summary of peak parking demand.

Figure 4-1 Summary of Peak Parking Demand with Shared Parking and Residential Parking Pricing

	Supply	Demand	Occupancy
Phase 1	1,621	1,553	95%
At build-out	3,878	3,814	98%

These estimates are conservative, as they do not take into account the impact of transit service improvements, bicycle facilities or carsharing. These investments will serve to reduce demand further, but – more importantly – provide amenities to residents and realistic alternatives to paying for parking.

PARKING SUPPLY

The proposed project will provide covered parking at a rate of one space per residential unit, one space per 500 sq. ft. of commercial space, and one space per five boat slips, which is consistent with parking requirements for the Waterfront Zoning District. Figure 4-2 shows the number of on-street and off-street parking spaces provided after Phase I and at project build-out.

Figure 4-2 Parking Supply

	On-street		Off-street	
Parcel	Phase 1	Total	Phase 1	Total
A	67	67	444	444
B	32	32	185	185
C	33	33	185	185
D	7	33	0	185
E	0	36	0	147
F	13	13	172	172
G	79	79	372	372
H	32	39	0	472
J	0	6	0	375
K	0	26	0	355
L	0	20	0	176
M	0	36	0	390
Total	**263**	**420**	**1,358**	**3,458**

PARKING DEMAND ANALYSIS

This section, together with Appendix A, which documents the full analysis, provides a quantitative estimate of parking demand in the development that can be used to guide the initial management of parking. Rather than using generic estimates of parking demand, they are adapted to consider how vehicle ownership and use patterns are likely to vary on the site:

- Estimates of residential parking demand are made using 2010 Census Transportation Planning Package vehicle ownership data from an Oakland traffic analysis zone with similar characteristics[4]
- Employee parking demand estimates are based on the expected number of employees in each parcel and employee mode split from two neighboring traffic analysis zones[5], rather than standard parking ratios from the Institute of Transportation Engineers.[6]
- Visitor parking demand is derived from assuming a commercial parking demand of two spaces per 1,000 sq. ft. and then subtracting employee parking demand (since these two together constitute the commercial demand)
- Marina parking demand is a conservative estimate based on standard parking ratios from the Institute of Transportation Engineers
- Recreational parking demand has not been estimated, since little or no data exists for estimating the number of recreational visitors. However, the figures show the number of parking spaces available for these visitors during daytime on weekdays and weekends.
- Allowance is made for shared parking, as different users will have different times of peak demand

Methodology

Residential Parking Demand

To estimate vehicle ownership amongst potential residents, 2010 Census Transportation Planning Package data from one of the adjacent traffic analysis zones was used.[7] This method generates an estimate of 1.25 vehicles per household, which is in between typical urban and suburban residential peak parking demand ratios.

Employee Parking Demand

Typically employee and customer/visitor parking demand are combined into a single analysis for commercial parking demand. However, these two components are separated in this analysis, since a key aim is to manage the parking to en- sure that the most convenient, visible spaces are

[4] TAZ 00103698 was used as this is coterminous with Block Group 1, Census Tract 4033, Alameda County, California which was used in the previous analysis.

[5] TAZ 00103698 (coterminous with Tract 4033, BG1) and 00103349 (coterminous with Tract 9832, formerly 4032) were used.

[6] Problems with the Institute of Transport Engineers' standard ratios are discussed in Shoup, Donald (2002), "Truth in Transportation Planning", Journal of Transportation and Statistics.

[7] TAZ 00103698 was used as this is coterminous with Block Group 1, Census Tract 4033, Alameda County, California which was used in the previous analysis.

available for customers. The 2003 Commercial Buildings Energy Consumption Survey from the Energy Information Administration reveals information about typical number of employees per 1,000 sq. ft. of gross floor area for more than 15 types of commercial uses, such as retail and grocery stores. This data was used to retrieve the expected number of employees in each parcel in the development.

The second step was to estimate the number of employees who will need a parking space in each parcel. The Census Transportation Planning Package (CTPP 2010.[8] . Neighboring traffic analysis zones include Jack London Square, This method generates an estimated parking demand of 0. 0.71 spaces per employee, based on 67% of employees driving alone and 9% carpooling.

Visitor Parking Demand

A review of parking demand of "main street districts" comparable to the Brooklyn Basin development found that parking occupancy rates for successful mixed-use districts ranged from just 1.6 to 1.9 spaces per 1,000 sq. ft. of non-residential built areas (see Figure 4-3). We have therefore assumed a commercial parking demand of 2 spaces per 1,000 sq. ft. of gross 1,000 sq. ft. of gross floor area in the Brooklyn Basin development. By subtracting employee parking demand in each parcel we get visitor parking demand (since these two together constitute the commercial demand).

Figure 4-3 Summary of Parking Occupancy in Four Main Street districts

		Mode Split[9]							Occupied Parking Spaces per 1,000 Sq. Ft.[10]
	City Population	Drove Alone	2 or More Person Carpool	Transit	Bicycle	Walked	Other Means	Worked at Home	
Chico	59,900	61%	12%	1%	11%	13%	1%	1%	1.7
Palo Alto	58,600	80%	9%	4%	3%	3%	1%	0%	1.9
Santa Monica	84,100	74%	11%	11%	1%	2%	1%	0%	1.8
Kirkland, WA[11]	45,600	77%	12%	4%	0%	2%	1%	4%	1.6

Marina Parking Demand

There is very little known about parking demand generated in marinas. There are several factors influencing parking demand, such as presence of guest boats (which typically will not need any parking), size of each boat, and the potential for public attraction. The ITE Parking Generation manual only refers to one study, where Saturday demand is 0.35 parking spaces per boat slip and Sunday demand is 0.59 spaces per slip. During weekdays parking demand is even lower.

[8] TAZ 00103698 (coterminous with Tract 4033, BG1) and 00103349 (coterminous with Tract 9832, formerly 4032) were used. These TAZs align with the census tracks that were used before.

[9] Source: Census Transportation Planning Package (CTTP) 2000.

[10] Sq. ft. refers to occupied non-residential built area in Chico and Palo Alto and both vacant and occupied non-residential built area in Santa Monica and Kirkland.

[11] Commuter mode split for Kirkland, Washington is not limited to the main street district, but covers commuting to the entire city, due to lack in data from CTPP 2000.

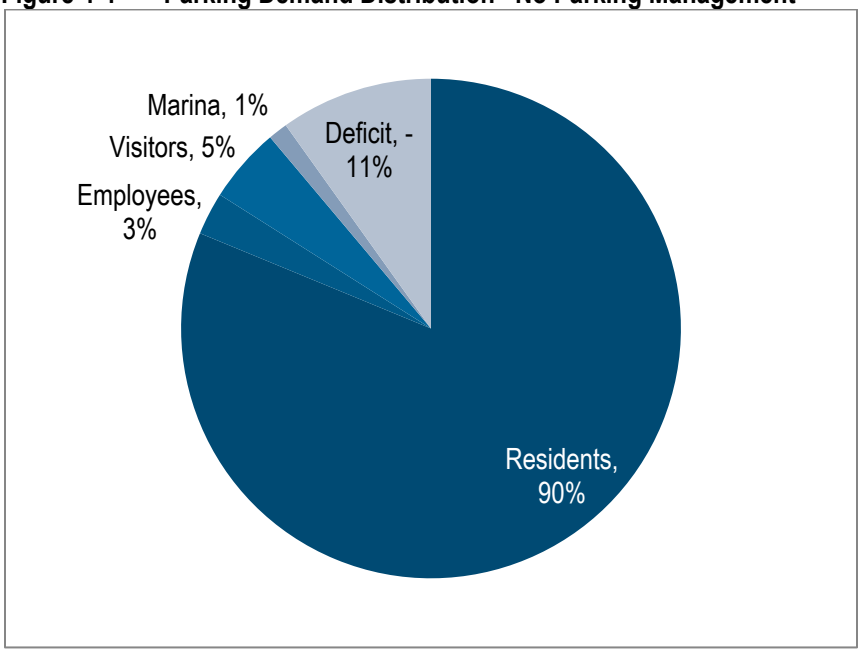
In this plan, we have assumed that its parking demand will be held constant during the entire week. To keep the analysis conservative, the Saturday parking demand for marina users was chosen over the weekday parking demand.

Overall Parking Demand with No Parking Management

Figure 4-4 shows how parking demand would be distributed between the four major parking user groups. Based on the methodology described above, there would be a deficit of 11% or 425 parking spaces (4,299 spaces needed of a total of 3,912 spaces provided) at project build-out, if no parking management strategies were implemented. In Phase I there would be a deficit of 132 parking spaces.

This analysis indicates that active parking management will be required to ensure that residents and employees as well as commercial and recreational visitors can easily find a space. This will help reduce the baseline parking demand. At the same time, these management strategies will help reduce the traffic impacts of the development, and encourage travel by transit, bicycle and walking. The group that is the most important to reach with parking management techniques is residents, who account for 90% of the total parking demand.

Figure 4-4 Parking Demand Distribution –No Parking Management



PROPOSED MANAGEMENT APPROACH

There are two key principles that should govern the management of parking in order to realize more “urban” demand ratios: charge the appropriate rate to maintain availability, and build and manage as much parking as possible as a common pool. These two principles will do the most to ensure that parking is readily available to all users. At the same time, these principles support other goals such as development marketability, improving walkability, reducing the cost and land requirements for parking, and maintaining public access to the shoreline.

Charging for Parking

Parking should be priced to reflect the real costs of its provision, and leased separately from residential or commercial space.

Although it is often provided at no charge to the user, parking is never free. A typical cost for structured parking in California is $20,000 in construction costs alone. This equates to a monthly cost of $130 per space, including debt service, operations and maintenance, insurance and enforcement. Where parking takes up land that could be put to other uses, it is appropriate to add in land costs as well. Even on-street spaces incur costs in terms of land value and maintenance.

Parking fees are generally subsumed into lease fees or sale prices for the sake of simplicity and because that is the more traditional practice in real estate. However, providing anything for free or at highly subsidized rates encourages use and means that more parking spaces have to be provided to achieve the same rate of availability. Charging for parking is also the single most effective strategy to encourage people to use alternatives to the single occupant vehicle.

It is important that parking fees not be seen as being punitive to "bad" car drivers. Parking fees can be made more acceptable by ensuring there are good alternatives to driving, by making it clear that the fees cover the costs of parking, and by providing different parking options at different price points.

It is also critical that residents are made aware that rents are reduced because parking is charged for separately. Rather than paying "extra" for parking, the cost is simply separated out – allowing residents and businesses to choose how much they wish to purchase. No resident should be required to lease any minimum amount of parking.

Effects on Residential Parking Demand

It is important to note that construction costs for residential parking spaces can substantially increase the sale/rental price of housing. This is because the space needs of residential parking spaces can restrict how many housing units can be built within allowable zoning and building envelope. For example, a study of Oakland's 1961 decision to require one parking space per apartment (where none had been required before) found that construction cost increased by 18% per unit, the number of units per acre decreased by 30% and land values fell by 33%.[12]

As a result, bundled residential parking can significantly increase "per-unit housing costs" for individual renters or buyers. Two studies of San Francisco housing found that units with off-street parking bundled with the unit sell for 11% to 12% more than comparable units without included parking.[13] One study of San Francisco housing found the increased afford- ability of units without off-street parking on-site can increase their absorption rate and make home ownership a reality for more people. In that study, units without off-street parking:

- Sold on average 41 days faster than com- parable units with off-street parking

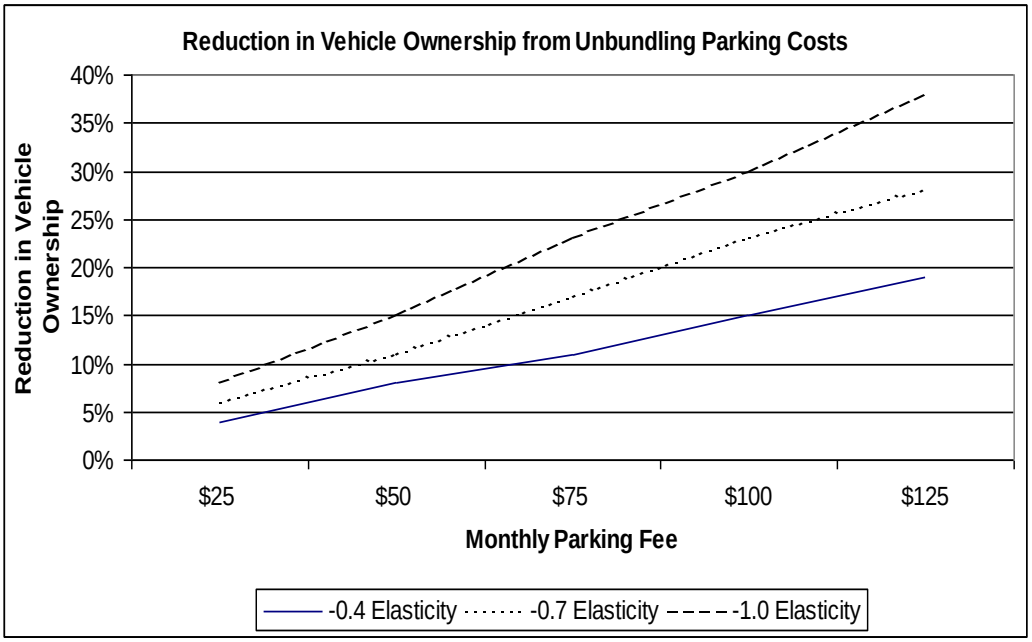
[12] Bertha, Brian. "Appendix A" in The Low-Rise Specula- tive Apartment by Wallace Smith UC Berkeley Center for Real Estate and Urban Economics, Institute of Urban and Regional Development, 1964.

[13] Wenyu Jia and Martin Wachs. "Parking Requirements and Housing Affordability: A Case Study of San Francisco." Univer- sity of California Transportation Center Paper No. 380,1998 and Amy Herman, "Study Findings Regarding Condominium Parking Ratios," Sedway Group, 2001.

- Allowed 20% more San Francisco house- holds to afford a condominium (com- pared to units with bundled off-street parking)
- Allowed 24% more San Francisco house- holds to afford a single-family house (compared to units with bundled off- street parking)

Charging separately for parking is also the single most effective strategy to encourage households to own fewer cars, and rely more on walking, cycling and transit. According to one study, unbundling residential parking can significantly reduce household vehicle owner- ship and parking demand. These effects are presented in Figure 4-5. Based on this data, we assume residential parking demand at Brooklyn Basin to fall by 11% if parking is unbundled from housing costs, and is charged for at cost – approximately $130 or more per month. Actual parking prices will be set by the developers at the time of sale.

Figure 4-5 Reduced Vehicle Ownership with Unbundled Residential Parking

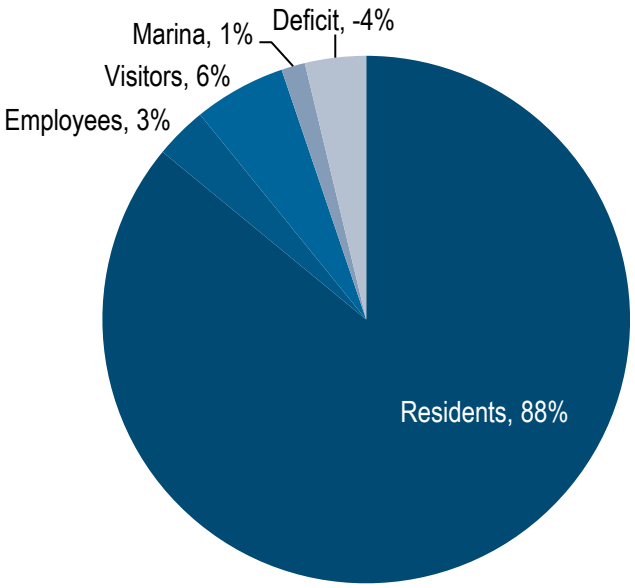


Source: Victoria Transport Policy Institute (2009), Parking Requirement Impacts on Housing Affordability, http://www.vtpi.org/park-hou.pdf

Effects on Total Parking Demand

Figure 4-6 shows the impacts of a $50/month parking charge for residents. There will be a total parking deficit of approximately 4%, or 149 spaces, at project build-out, with 127 on-street parking spaces available and a deficit of 276 off-street parking spaces. In phase I, the parking deficit will be smaller, with 1% or 24 spaces needed, with 97 on-street parking spaces available and a deficit of 121 off-street spaces at peak times. See Appendix B for the full parcel-by-parcel calculations.

Figure 4-6 Parking Demand With Unbundled Parking



The policy of pricing parking does not preclude the charging of different rates to different users or in different areas. For example residents might pay a premium for an assigned space. These and other recommendations are discussed in later sections of this chapter.

Allow for a public and shared parking system

The mix of uses at Brooklyn Basin, their physical proximity to each other and their staggered times of peak parking demand set the stage for a successful shared parking arrangement. Uses that could share parking include:

- Residential
- General commercial
- Grocery store
- Marina
- Public shoreline access

There is likely a shared parking reduction for retail of up to about 160 spaces, which is largely achieved by the mixed-use nature of the development rather than physical sharing of spaces. There are potentially greater reductions that could be achieved through the strategies discussed below, particularly through a move away from assigned residential spaces for some users. Greater use of shared parking will allow for a greater "buffer" that can absorb the natural variations in parking demand, and account for the uncertainties in demand analysis. It also allows potentially greater shared parking reductions to be factored into Phase II of the development.

A common management framework for parking spaces allows the supply to be utilized in the most efficient way possible. It facilitates the sharing of parking between commercial and residential uses and recreational users, and allows the greatest availability for a given level of supply. This principle capitalizes on the facts that lower-than-expected demand among some users can

compensate for higher demand amongst others, and that the demand among users is staggered throughout different times of the day.

The parking supply can be divided into five broad categories, based on the physical location of spaces and their real or perceived degree of 'public ownership'. At one extreme, garages provide private parking facilities, while at the other end of the spectrum on-street parking is generally perceived as open to all. 'Public' spaces are the easiest to manage as a common pool, since there are no limitations as to who is allowed to park and there is one administrative body that manages the supply for multiple users. Therefore the proportion of public spaces should be maximized.

The current site plan already ensures that all spaces can be made public. This feature needs to be retained throughout the planning process, to ensure that physical design decisions do not constrain access for any group of users. Note that this principle does not preclude the use of controlled-access systems (e.g. garage access via card) or provision of assigned spaces at a premium cost.

Effects on Total Parking Demand

The analysis shows that peak parking demand for Brooklyn Basin occurs around 8:00 PM during weekdays, when residents have returned from work and restaurants on the site are busy. Since there is very little data available for marina usage, we have assumed that its parking demand will be held constant during the entire week (conservative estimate). Appendix C contains details about the effects of shared parking on demand, both for Phase I and at project build-out.

As Figure 4-7 and

Figure 4-8 show, there will be a surplus of 64 parking spaces during peak demand (8:00 PM during weekdays) at project build-out. Many of the parcels are projected to not satisfy their residential parking demand on the same parcel. For these parcels, there is a very small surplus of spaces on adjacent parcels G and H that can be provided to residents at discounted rates. Overall, 2% of all parking spaces – and 51% of all on-street spaces – will be available at this time. This gives an overall occupancy level of 98%, which means users may have to spend some time looking for parking but ultimately should be able to find a space.

On weekend days, there will be more than 100 spaces available on-street and good availability in the Parcel G Garage (which will be open to the public). All of these spaces can be used by recreational visitors to the site.

Figure 4-7 On-Street Parking Demand (8PM on Weekday)

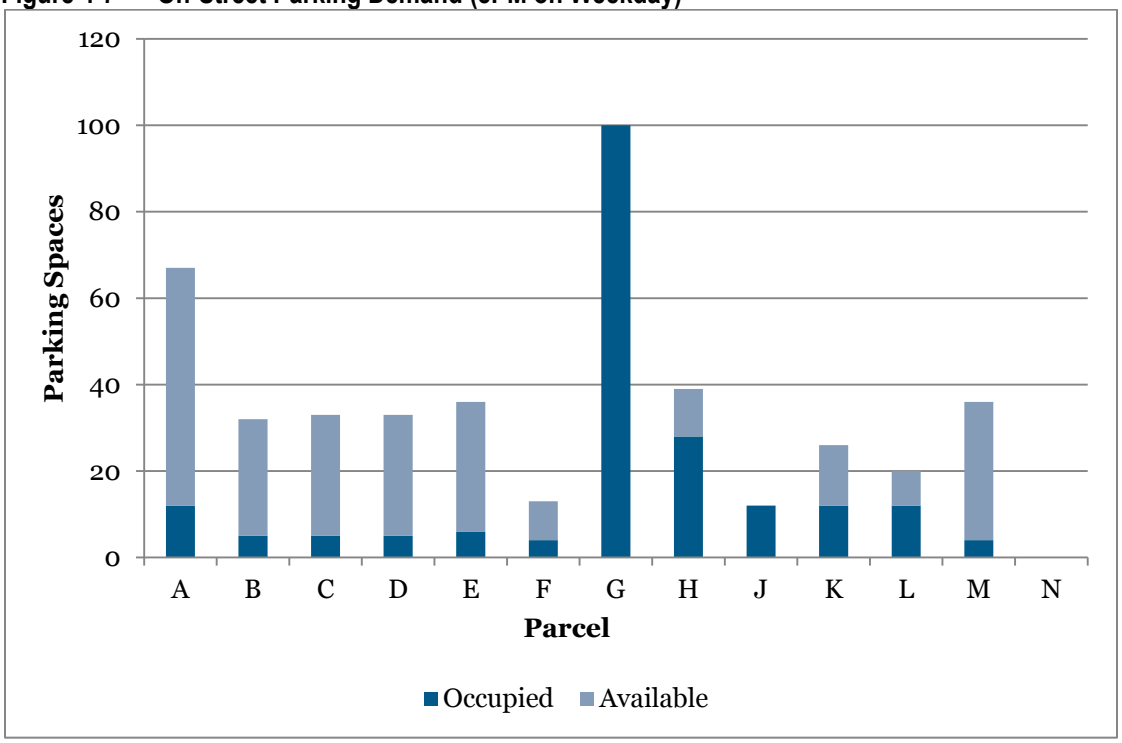
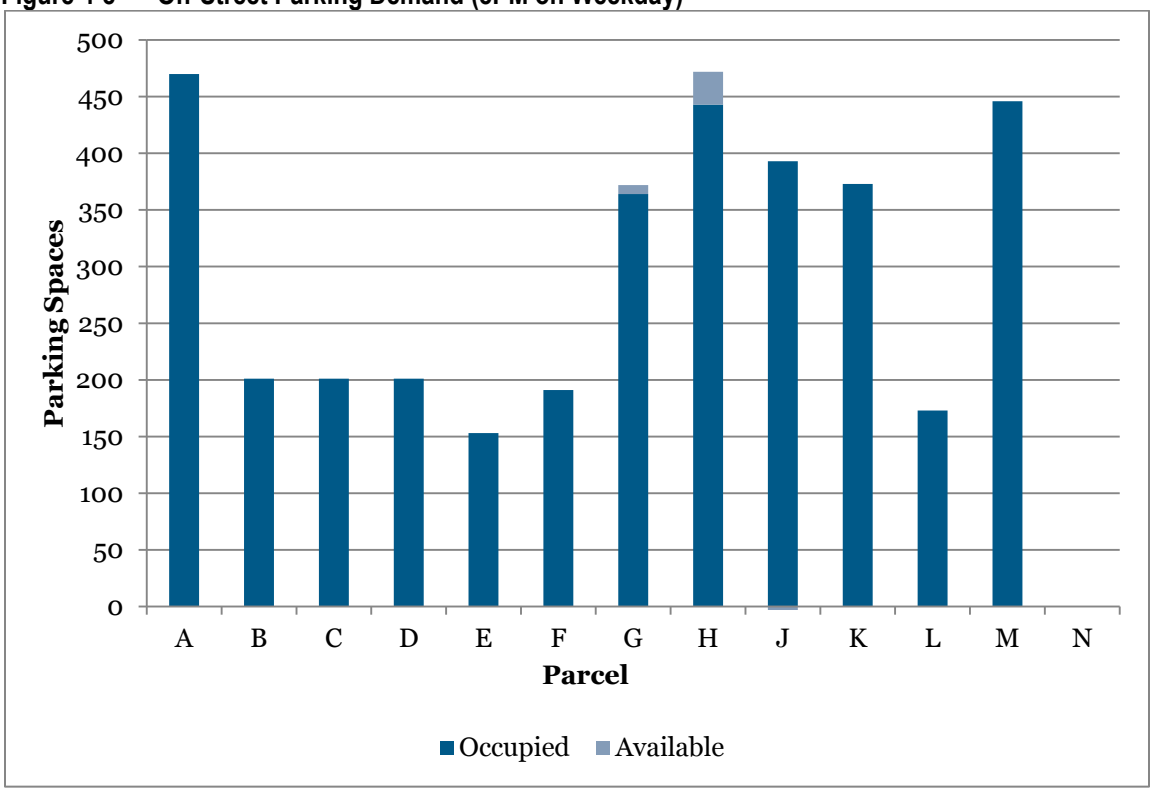


Figure 4-8 Off-Street Parking Demand (8PM on Weekday)



Segment Users Based on Price

Parking pricing is the most effective tool available to manage demand, facilitate shared parking and steer users to parking facilities with spare capacity. The exact pricing structure will evolve over time; this discussion is intended as an example of how users can be segmented based on their individual tradeoffs between price and convenience.

For residential parking, assigned spaces that are reserved for an individual household should command a premium price. These spaces are likely to be close to the garage entrance. Households that do not wish to pay for an assigned space could opt for a lower-cost permit that would allow them to park in their preferred facility (i.e., the parking structure in the same building as their residential unit). This would provide an economic incentive for them to share spaces with employees and other residents.

If necessary to balance demand between various parking structures, permits could be offered at an even lower cost to households that are willing to park in another structure, and walk the short distance to their residential unit.

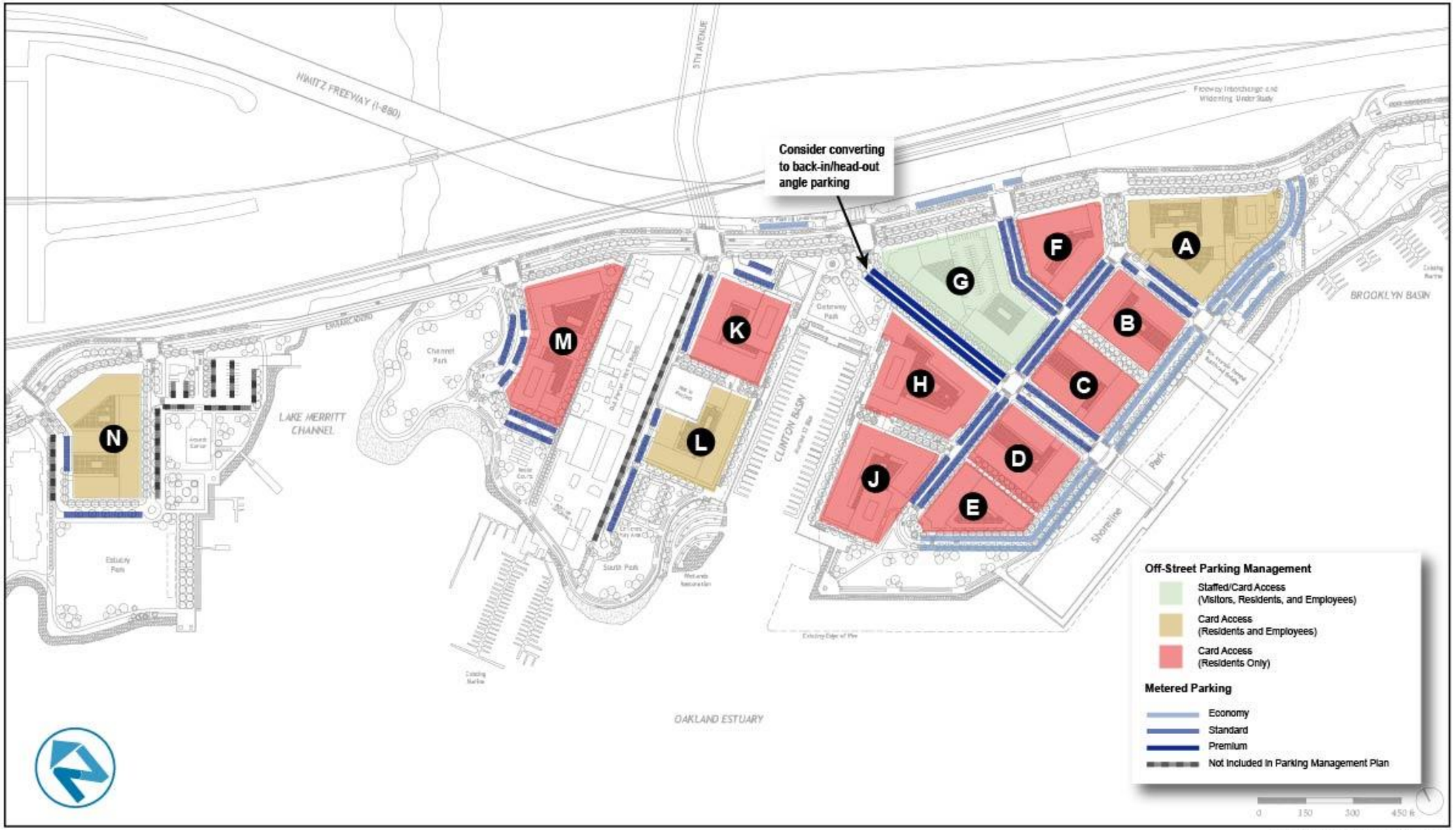
Pricing could also distinguish between households with different numbers of vehicles. For example, residents could receive a percentage discount on the first permit per household, with subsequent permits being sold at full cost.

Figure 4-9 illustrates proposed locations for visitors, employees and residents, as well as the three tiers of on-street parking. This proposal concentrates employee parking in controlled access garages on Parcels G, H, L and M.

Meter On-Street Parking

The developer encourages the City to implement on-street metered parking in Brooklyn Basin. .

Figure 4-9 Proposed Parking Locations



Basemap Source: ROMA Design Group

OPTIONAL PARKING POLICIES

The following parking management strategies are optional, and may be undertaken by the property manager if conditions warrant.

Strategy	Detail
Install Controlled Access Systems to All Garages	Controlled access systems may be used to manage use of the structured parking supply.The varied composition of the parking supply gives an opportunity to direct certain users to different types of parking. This can maximize flexibility, while minimizing revenue collection costs.
Parking Cash Out	Since parking will be leased separately from commercial space, parking cash-out is actually mandated through state law for any employer with more than 50 employees. However, as per the development's conditions of approval, Brooklyn Basin property managers will encourage employers to implement this strategy.
Establish a Car-Sharing Program	City CarShare and Zipcar provide car-sharing services in San Francisco, Oakland and Berkeley. Carsharing is likely to be ultimately successful at Brooklyn Basin, it will be a marginal location for car-sharing in the early phases of development. Brooklyn Basin property managers will work with car sharing providers to encourage expansion to the development as soon as possible. Note that because the development proposes minimum allowable number of parking spaces, developers would have to increase parking to provide dedicated car sharing spaces. Note that this will policy will be suggested to, but cannot be required of future developers.
Undertake Continuous Monitoring	Continuous monitoring of parking occupancy can help to effectively manage the parking supply, so that decisions on pricing and space assignments can be made. Controlled access systems for the parking garages can allow this information to be gathered automatically, but regular counts of on-street parking occupancy will also be needed. The property managers may undertake these activities

Appendix A

Parking Demand Baseline

A-1 Baseline Parking Demand: Phase 1

Parcel	Parking Supply		Parking Demand					Surplus/ Deficit		
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	Total	On-Street	Off-Street	Net
A	67	444	509	11	19	0	539	48	-75	-28
B	32	185	219	4	8	0	231	24	-38	-14
C	33	185	219	4	8	0	231	25	-38	-13
D	33	185	219	4	8	0	231	25	-38	-13
E	36	147	164	6	10	0	180	26	-22	3
F	13	172	206	4	6	0	216	7	-38	-31
G	79	372	375	36	65	60	535	-45	-39	-84
H	39	472	469	26	46	0	541	-7	-22	-30
J	6	375	424	11	19	0	454	-13	-59	-73
K	26	355	403	11	19	0	433	7	-58	-52
L	20	176	183	11	19	0	213	1	-17	-17
M	36	390	488	4	6	0	498	30	-101	-72
Total	0	0	0	0	0	0	0	0	0	0

Assumptions

- Saturday will yield peak demand, with peak in marina and recreational usage, as well as in residential and retail/commercial usage
- Residential parking demand based on vehicle ownership west and north of the site
- Parking demand per 1,000 square feet of retail uses: 2 spaces Based on main street parking demand in 6 cities
- Parking demand per boat slip: 0.35 spaces ITE Parking Generation, Code 420, Saturday Demand

A-2 Baseline Parking Demand: Build-Out

Parcel	Parking Supply		Parking Demand					Surplus/ Deficit		
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	Total	On-Street	Off-Street	Net
A	67	444	509	11	19	0	539	48	-76	-28
B	32	185	219	4	8	0	231	24	-38	-14
C	33	185	219	4	8	0	231	25	-38	-13
D	33	185	219	4	8	0	231	25	-38	-13
E	36	147	164	6	10	0	180	26	-23	3
F	13	172	206	4	6	0	216	7	-38	-31
G	79	372	375	36	65	60	536	-46	-39	-85
H	39	472	469	26	46	0	541	-7	-23	-30
J	6	375	424	11	19	0	454	-13	-60	-73
K	26	355	403	11	19	0	433	7	-59	-52
L	20	176	183	11	19	0	213	1	-18	-17
M	36	390	488	4	6	0	498	30	-102	-72
Total	**420**	**3,458**	**3,878**	**132**	**233**	**60**	**4,303**	**127**	**-552**	**-425**

Assumptions

- Saturday will yield peak demand, with peak in marina and recreational usage, as well as in residential and retail/commercial usage
- Residential parking demand based on vehicle ownership west and north of the site
- Parking demand per 1,000 square feet of retail uses: 2 spaces Based on main street parking demand in 6 cities
- Parking demand per boat slip: 0.35 spaces ITE Parking Generation, Code 420, Saturday Demand

Appendix B

Parking Demand with Residential Unbundled Parking

B-1 Parking Demand with Residential Unbundled Parking: Phase 1

Parcel	Parking Supply		Parking Demand					Surplus/ Deficit		
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	Total	On-Street	Off-Street	Net
A	67	444	458	11	19	0	488	48	-25	23
B	32	185	197	4	8	0	209	24	-16	8
C	33	185	197	4	8	0	209	25	-16	9
D	33	185	197	4	8	0	209	25	-16	9
E	36	147	147	6	10	0	163	26	-6	20
F	13	172	186	4	6	0	196	7	-18	-11
G	79	372	338	36	65	60	497	-46	-2	-48
H	39	472	422	26	46	0	494	-7	24	17
J	6	375	381	11	19	0	411	-13	-17	-30
K	26	355	362	11	19	0	392	7	-18	-11
L	20	176	164	11	19	0	194	1	1	2
M	36	390	439	4	6	0	449	30	-53	-23
Total	**420**	**3,458**	**3,488**	**132**	**233**	**60**	**3,911**	**127**	**-162**	**-35**

Assumptions

- Saturday will yield peak demand, with peak in marina and recreational usage, as well as in residential and retail/commercial usage
- Residential parking demand based on vehicle ownership west and north of the site
- Parking demand per 1,000 square feet of retail uses: 2 spaces Based on main street parking demand in 6 cities
- Parking demand per boat slip: 0.35 spaces ITE Parking Generation, Code 420, Saturday Demand
- Unbundling of residential parking costs will yield a 7% parking demand reduction

B-2 Parking Demand with Residential Unbundled Parking: Build-Out

Parcel	Parking Supply		Parking Demand					Surplus/ Deficit		
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	Total	On-Street	Off-Street	Net
A	67	444	458	11	19	0	488	48	-25	23
B	32	185	197	4	8	0	209	24	-16	8
C	33	185	197	4	8	0	209	25	-16	9
D	7	0	0	0	0	0	0	7	0	7
E	0	0	0	0	0	0	0	0	0	0
F	13	172	186	4	6	0	196	7	-18	-11
G	79	372	338	36	65	60	499	-46	-2	-48
H	32	0	0	0	0	0	0	32	0	32
J	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0
Total	**263**	**1,358**	**1,376**	**59**	**106**	**60**	**1,601**	**97**	**-77**	**20**

Assumptions

- Saturday will yield peak demand, with peak in marina and recreational usage, as well as in residential and retail/commercial usage
- Residential parking demand based on vehicle ownership west and north of the site
- Parking demand per 1,000 square feet of retail uses: 2 spaces Based on main street parking demand in 6 cities
- Parking demand per boat slip: 0.35 spaces ITE Parking Generation, Code 420, Saturday Demand
- Unbundling of residential parking costs will yield a 7% parking demand reduction

Appendix C

Parking Demand with Residential Unbundled Parking and Shared Parking

C-1 Parking Demand with Residential Unbundled Parking and Shared Parking: Phase 1

Parcel	Parking Supply		Parking Demand				Shared Parking Analysis								Peak Period Surplus/ Deficit	
							Weekday 2 PM		Weekday 8PM		Saturday 2PM		Saturday 8PM			
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	On-Street	Off-Street	On-Street	Off-Street	On-Street	Off-Street	On-Street	Off-Street	On-Street	Off-Street
A	67	444	458	11	19	0	18	285	12	456	19	336	10	427	55	-12
B	32	185	197	4	8	0	8	122	5	196	8	144	4	183	27	-11
C	33	185	197	4	8	0	8	122	5	196	8	144	4	183	28	-11
D	33	185	197	4	8	0	8	122	5	196	8	144	4	183	28	-11
E	36	147	147	6	10	0	10	94	6	148	10	110	6	139	30	-1
F	13	172	186	4	6	0	6	115	4	185	6	136	3	173	9	-13
G	79	372	338	36	65	60	123	238	100	353	125	276	96	331	-21	19
H	39	472	422	26	46	0	45	278	28	429	46	326	25	403	11	43
J	6	375	381	11	19	0	18	239	12	380	19	282	10	357	-6	-5
K	26	355	362	11	19	0	18	228	12	361	19	268	10	339	14	-6
L	20	176	164	11	19	0	18	109	12	167	19	127	10	157	8	9
M	36	390	439	4	6	0	6	267	4	433	6	316	3	406	32	-43
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
							2,507		**3,701**		**2,901**		**3,470**		**177**	

Shared Parking Assumptions (Source: ULI Shared Parking Manual)

	Weekday 2PM	Weekday 8PM	Saturday 2PM	Saturday 8PM
Residential	60%	98%	71%	92%
Retail	97%	61%	100%	55%

1.	Parking demand per 1,000 square feet of retail uses:	2 spaces	Based on main street parking demand in 6 cities
2.	Parking demand per boat slip:	0.35 spaces	ITE Parking Generation, Code 420, Saturday Demand

3. Unbundling of residential parking costs will yield a 7% parking demand reduction

C-2 Parking Demand with Residential Unbundled Parking and Shared Parking: Build-Out

Parcel	Parking Supply		Parking Demand				Shared Parking Analysis								Pea Surp
							Weekday 2 PM		Weekday 8PM		Saturday 2PM		Saturday 8PM		
	On-Street	Off-Street	Residents	Employee	Visitors	Marina	On-Street	Off-Street	On-Street	Off-Street	On-Street	Off-Street	On-Street	Off-Street	On-Stre
A	67	444	458	11	19	0	18	285	12	456	19	336	10	427	55
B	32	185	197	4	8	0	8	122	5	196	8	144	4	183	27
C	33	185	197	4	8	0	8	122	5	196	8	144	4	183	28
D	33	185	197	4	8	0	8	122	5	196	8	144	4	183	28
E	36	147	147	6	10	0	10	94	6	148	10	110	6	139	30
F	13	172	186	4	6	0	6	115	4	185	6	136	3	173	9
G	79	372	338	36	65	60	123	238	100	353	125	276	96	331	-21
H	39	472	422	26	46	0	45	278	28	429	46	326	25	403	11
J	6	375	381	11	19	0	18	239	12	380	19	282	10	357	-6
K	26	355	362	11	19	0	18	228	12	361	19	268	10	339	14
L	20	176	164	11	19	0	18	109	12	167	19	127	10	157	8
M	36	390	439	4	6	0	6	267	4	433	6	316	3	406	32
Total	**420**	**3,458**	**3,488**	**132**	**233**	**60**	**286**	**2,219**	**205**	**3,500**	**293**	**2,609**	**185**	**3,281**	**215**
							2,505		**3,705**		**2,902**		**3,466**		

Shared Parking Assumptions (Source: ULI Shared Parking Manual)

	Weekday 2PM	Weekday 8PM	Saturday 2PM	Saturday 8PM
Residential	60%	98%	71%	92%
Retail	97%	61%	100%	55%

1.	Parking demand per 1,000 square feet of retail uses:	2 spaces	Based on main street parking demand in 6 cities
2.	Parking demand per boat slip:	0.35 spaces	ITE Parking Generation, Code 420, Saturday Demand

3. Unbundling of residential parking costs will yield a 7% parking demand reduction

Appendix D Comparison of Cost and Operational Considerations for Transit Operations (AC Transit Estimates)

D-1 Transit Operational Considerations - Peak (AC Transit Estimates)

	*Proposed Line 1 Extension (10 min frequency) 6am-8pm	Proposed Broadway Shuttle Extension (10-12 min frequency) 7am - 7pm	Proposed Line 88 Extension (20 min frequency) 5am-10pm	Estimated Private Shuttle to 12th St BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm	Estimated Private Shuttle to Lake Merritt BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm
Travel Time (min)	75	24	86	-	-
Additional Distance to Brooklyn Basin (miles)	3.4	2.5	2.5	4.1	2.8
Additional Travel time to Brooklyn Basin (min)	16	11	11	19	13
Layover** (min)	12	6	12	2	1
Cycle Time (min)	103	41	109	21	14
Frequency (min)	10	10	20	15	15
Current Vehicles Required	9	3	5	-	-
New Vehicles Required	10.26	4.14	5.47	1.37	0.95
New Vehicles Required (Rounded up)	11	5	6	2	1
Additional Vehicles required for Brooklyn Basin (min)	1	2	1	2	1

D-2 Transit Operational Considerations - Off Peak (AC Transit Estimates)

	*Proposed Line 1 Extension (10 min frequency) 6am-8pm	Proposed Broadway Shuttle Extension (10-12 min frequency) 7am - 7pm	Proposed Line 88 Extension (20 min frequency) 5am-10pm	Estimated Private Shuttle to 12th St BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm	Estimated Private Shuttle to Lake Merritt BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm
Travel Time (min)	-	24	-	-	-
Additional Distance to Brooklyn Basin (miles)	-	2.5	-	4	2.8
Additional Travel time to Brooklyn Basin (min)	-	11	-	19	13
Layover** (min)	-	6	-	2	1
Cycle Time (min)	-	41	-	21	14
Frequency (min)	-	12	-	30	30
Vehicles Required	-	3.45	-	0.69	0.48
Vehicles Required (Rounded up)	-	4	-	1	1
SCHEDULE					
Total Hours of Peak Frequency Service (hr)	14.00	7.00	17.00	7.00	7.00
Total Hours of Off - Peak Frequency Service (hr)		6.00		7.00	7.00
Time to Lake Merritt BART (mins)	-		6 & 7	-	6 & 7
Time to 12th St BART (mins)	10 & 9	10 & 9	-	10 & 9	

D-3 Transit Scenario Cost Estimates (As Determined by AC Transit)

	Proposed Local Telegraph Extension route (10 min frequency)	Proposed Broadway Shuttle Extension (10-12 min frequency) in service 7am - 7pm	Proposed 88 Extension (20 min frequency) 5am-10pm	Estimated Private Shuttle to 12th St BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm	Estimated Private Shuttle to Lake Merritt BART (15 min frequency peaks) (30min frequency off-peak) 6am-8pm
PRICING	AC Transit Marginal Rate			Estimated Private Shuttle Cost per TDM Plan	
Hourly Marginal Rate ($)	$85.68	$85.68	$85.68	$85.00	$85.00
Daily Cost ($)	$1,200	$1,714	$1,457	$1,785	$1,190
ANNUAL COST for Brooklyn Basin service	$ 305,878	$ 436,968	$ 371,423	$ 455,175	$ 303,450
	AC Transit Direct Rate				
Hourly Direct Rate ($)	$ 132.45	$ 135.45	$ 132.45	-	-
Daily Cost ($)	$1,854	$2,709.00	$2,252	-	-
ANNUAL COST for Brooklyn Basin service	$ 472,847	$ 690,795	$ 574,171	-	-
* With the opening of International Ave. BRT, the Telegraph Ave. segment of Line 1 extends to Brooklyn Basin. This reroute assumes Lines 72/72M terminate in downtown Oakland so the proposed Telegraph line only costs one net bus.					
* *Estimating 10% layover for private shuttle option					