RESOLUTION NO. 66,617–N.S.

ESTABLISHING A REQUIREMENT THAT APPLICANTS FOR LARGE SCALE OFFICE, RETAIL/RESTAURANT, MANUFACTURING/INDUSTRIAL, HOTEL/LODGING, WAREHOUSE/STORAGE, RESEARCH AND DEVELOPMENT AND OTHER COMMERCIAL DEVELOPMENT PROJECTS MITIGATE THE PROJECT'S IMPACTS ON AFFORDABLE HOUSING

BE IT RESOLVED by the Council of the City of Berkeley as follows:

Section 1. Purpose

The purpose of this Resolution is to implement the Berkeley General Plan as amended and to implement Berkeley Municipal Code (hereafter, "BMC") Chapter 22.20 with respect to affordable housing. This Resolution provides that Applicants for commercial development projects that are located in non-residential zones mitigate the impacts that their developments cause with respect to the need for affordable housing, either by creating affordable housing as described below, or paying an impact fee in lieu of creating such housing.

Section 2. DEFINITIONS

The terms used herein shall be as defined in BMC Chapter 22.20 and Chapter 23F.04 (Definitions). Office, Retail/Restaurant, Manufacturing/Industrial, Hotel/Lodging, Warehouse/Storage, and Research and Development projects shall be as defined in Exhibit A attached hereto and made a part hereof of this Resolution.

Section 3. APPLICABILITY

A. Except as provided in paragraph C below, this Resolution shall apply to all new commercial construction in which the net additional, newly constructed gross floor area is over 7,500 square feet. New construction shall also include alteration of buildings over 7,500 square feet that have been substantially vacant of all uses for at least three (3) years if there is a change of use that is intended to intensify employment on the site.

B. This Resolution shall apply to all projects, including, but not limited, those sponsored by private entities, public entities, for-profit organizations, and non-profit organizations except to the extent prohibited by law.

C. This Resolution shall not apply to Residential Use or Child Care Centers or Facilities development projects as defined in BMC Chapter 23F.04 (Definitions).

D. Nothing in this section is intended or shall be construed as relieving any Applicant from providing housing or paying a fee imposed by the City independent of BMC Chapter 22.20 and this Resolution as a condition of any

entitlement, in order to mitigate potential adverse impacts identified in the environmental review of a project under CEQA.

Section 4. PROCEDURES

The Office of Economic Development shall calculate the amount of Affordable Housing or In-Lieu Fee according to the formulas described below or, if the Applicant is applying for an exception under BMC Section 22.20.070 or 22.20.080, respond to the factual proof submitted to claim eligibility for the exception. The amount of Affordable Housing or the Fee required for end uses other than office, retail/restaurant, manufacturing/industrial, hotel/lodging, warehouse/storage, and research and development shall be calculated by using the formula for the most similar building type, adjusted to account for the use's actual long-term employment capacity.

A. PROVISION OF AFFORDABLE HOUSING UNIT(S) OR PAYMENT OF AN IN-LIEU FEE

An Applicant may either: (1) create one unit of housing either on site or off site within the City of Berkeley (with an average size of two bedrooms) affordable to households whose income is at or below 30% of the area median income ("Affordable Housing"); or (2) pay an equivalent In-Lieu Impact Fee ("Fee") as set forth in the following table.

Use	**Affordable Housing Unit**	**Fee**
Office or Research and Development space	1 unit/52,859 gross square feet	$4.50/gross square foot
Retail/restaurant or Hotel/lodging space	1 unit /52,859 gross square feet	$4.50/gross square foot
Industrial/manufacturing or Warehouse/storage (except "self-storage" space classified in NAICS as industry 531130)	1 unit /105,719 gross square feet	$2.25/gross square foot
Self-storage space classified in NAICS as industry 531130	1 unit /54,432 gross square feet	$4.37/gross square foot

Applicant may elect to provide an equivalent combination of Affordable Housing units and Fees. The levels may be reduced under Section 4B of this Resolution.

When the number of Affordable Housing units to be generated under this Section results in a requirement to provide a fraction of a unit, the Applicant shall pay a Fee proportional to the fractional unit.

An Applicant that elects to produce the Affordable Housing rather than pay the Fee must show evidence of site control and a Use Permit for the Affordable Housing project prior to issuance of the Occupancy Permit for the non-residential project, and must secure an Occupancy Permit for the Affordable Housing project no later than eighteen (18) months from the receipt of the Occupancy Permit for the non-residential project. The City Manager or his/her designee and/or the Zoning Adjustments Board, may for good cause permit a longer period to provide the Affordable Housing. Compliance with these conditions will be assured by the City executing an appropriate form of security on the non-residential and/or Affordable Housing project property in an amount not to exceed the amount of the Fee that otherwise would have been charged. Interest shall be charged on the fee equivalent value of the Affordable Housing for any extension beyond eighteen months from receipt of the Occupancy permit for the non-residential project.

Fees under this Section shall be paid in three equal installments. The first payment shall be made prior to the development Project's receipt of its Building Permit. The second payment shall be made prior to the development Project's receipt of its Occupancy Permit for the building shell. The third payment shall be made prior to the first anniversary of this Occupancy Permit. The final payment shall be appropriately secured by the City, e.g., by a letter of credit, bond, Promissory Note, Deed of Trust or another appropriate form of security. Payment schedules that differ from the above standard, and other late payments, shall incur an interest charge. Other payment schedules may be structured upon the approval of the City Manager or his/her designee and/or the Zoning Adjustments Board.

B. EXCEPTIONS – With respect to any of the actions or payments in this Resolution, Applicants may request reductions in Affordable Housing or Fee requirements in accordance with the provisions of BMC Sections 22.20.070 or 22.20.080 relating to lower levels of impact, or infeasibility and overriding benefits to the City. If a reduction or exception is requested, relevant materials documenting the factual proof for the claim shall be submitted to the City for evaluation prior to a decision.

C. APPEAL – The appeal process for these exactions or mitigations shall be as defined BMC Section 22.20.100.

Section 5. MITIGATION FUNDS

Fees paid pursuant to this Resolution, shall be deposited in the City's Housing Trust Fund and shall be used to create additional Affordable Housing units and other below market-rate housing within the City of Berkeley. Government Code 66006 requires local agencies to submit annual and five-year reports detailing the status of impact fees, including this Affordable Housing Mitigation Fee. The annual report must be made available to the public within 180 days after the last

day of the fiscal year, and must be presented to the City Council at least 15 days after it is made available to the public.

Section 6. REVISION OF AFFORDABLE HOUSING UNIT AND FEE LEVEL REQUIREMENTS

The Affordable Housing Unit and Fee levels in Section 4.A shall be revised annually on July 1 of each year beginning July 1, 2015, based on the change in the Consumer Price Index, All Urban Consumers, San Francisco Bay Area.

In addition, this Resolution may be amended from time to time to reflect current social and economic data used in the calculations of the mitigation impacts and their corresponding actions and fees found herein. This Resolution shall be completely reviewed and updated every five (5) years to keep pace with changing market, socio-economic, and funding conditions. If upon review it can be determined that ongoing funding from local sources exists in sufficient amounts to substantially meet the needs for affordable housing under this Resolution, then this Resolution shall be rescinded, or the dollars amounts reduced, by the Berkeley City Council.

Section 7. FINDINGS AND DETERMINATIONS

Pursuant to Government Code section 66001, the Council hereby finds and determines as follows:

A. The purposes of the Affordable Housing Unit and Fee requirements of this Resolution are to implement the Berkeley General Plan and BMC Section 22.20 to ensure that applicants for specified development projects provide appropriate mitigation to reduce or eliminate the adverse impacts such projects otherwise would have on the City's needs for Affordable Housing.

B. The Fee required by this Resolution shall be deposited into the City's Housing Trust Fund to be used as set forth in Section 5 of this Resolution in order to create additional Affordable Housing units and other below market-rate housing within the City of Berkeley in order to mitigate, reduce or eliminate the adverse impacts on the City's needs for Affordable Housing which otherwise would result from development projects in the City.

C. There is a reasonable relationship between the amount of Affordable Housing to be provided, or the In-Lieu Fees to be paid, and the types of development projects to which it, and the other requirements of this Resolution, apply as set forth in the "mitigation rationale" (B. Lambert and D. Fogarty, Documentation of Linkage Between Commercial and Industrial Development in Berkeley and Need for Low and Very-Low Income Housing in Berkeley, Updated, October 2012), which is attached hereto incorporated herein by this reference and which shall be maintained and revised as required by this Resolution and BMC Section 22.20.

Section 8. EFFECTIVE DATE OF AFFORDABLE HOUSING REQUIREMENT AND IN LIEU FEES

The affordable housing requirement and fees established by this Resolution shall become effective 60 days from the date of enactment of this Resolution.

The foregoing Resolution was adopted by the Berkeley City Council on June 3, 2014 by the following vote:

Ayes: Anderson, Arreguin, Capitelli, Maio, Moore, Wengraf, Worthington, Wozniak and Bates.

Noes: None.

Absent: None.

Tom Bates, Mayor

Attest:
Mark Numainville, CMC, City Clerk

EXHIBIT A

Office

Office means a building or a portion of a building where people work at desks doing business, administrative or professional activities. Unlike other definitions here, "office" cannot be defined as a sector or sectors of the North American Industry Classification System (NAICS) because, while all or most of the activities of Sectors 51 (Information), Sector 52 (Finance and Insurance), Sector 53 (Real Estate and Leasing), Sector 54 (Professional, Scientific and Technical Services), and Sector 55 (Management of Companies and Enterprises) are conducted in offices, part of the activities of other sectors occur there as well.

Retail

Retail means buildings or a portion of a building occupied by establishments engaged in retailing merchandise and rendering services incidental to the sale of merchandise. These include all types of businesses listed in Sectors 44-[45, Retail Trade, of the latest edition of the North American Industry Classification System (NAICS).

Restaurant

Restaurants include establishments that prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption, including all types of businesses listed in subsector 722, Food Services and Drinking Places, of the latest edition of the North American Industry Classification System (NAICS).

Manufacturing/industrial

Manufacturing/industrial buildings house establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. These include all types of businesses listed in Sectors 31-33, Manufacturing, of the latest edition of the North American Industry Classification System (NAICS).

Hotel/lodging

Buildings providing lodging or short-term accommodations for travelers, vacationers and others, including hotels, motels, bed-and-breakfast inns and all other types of establishments in subsector 721, Accommodation, of the latest edition of the North American Industry Classification System (NAICS).

Warehouse/storage

Buildings that house establishments engaged in wholesaling merchandise, an intermediate step in the distribution of merchandise. Wholesalers sell merchandise to other businesses. However, the category also includes storage businesses that operate facilities to store goods without selling them, primarily for other businesses. Wholesale businesses are Sector 42 of the North American Industry Classification System (NAICS). Storage businesses are in subsector 493, Warehousing and storage, of NAICS. "Mini-storage" or "self-storage" facilities that rent space for self-storage are a different industry classified by NAICS in Sector 53, Real Estate and Rental and Leasing.

Mini-storage or self-storage
Buildings where customers rent space (containers, lockers, etc.) on a short-term or long-term basis to store and retrieve their goods. In many cases, articles may be stored by homeowners or renters though businesses also use these facilities. This industry, 531130, Lessors of Miniwarehouses and Self-Storage Units, is classified by NAICS in Sector 53, Real Estate and Rental and Leasing.

Research and Development
Buildings for research and experimental development in the physical, engineering or life sciences. Some buildings ("laboratories"), particularly for biotechnology, chemistry biology and related applications, have specialized ventilation equipment that allow work areas to be isolated from more unrestricted portions of the building. Research and development buildings are often part of businesses that are classified as biomedical or pharmaceutical manufacturers, but as a stand-alone activity it is classified by NAICS in Sector 54, Professional, Scientific and Technical Services

CITY OF BERKELEY

Documentation of Linkage Between Commercial and Industrial Development In Berkeley and Need for Low and Very-Low Income Housing in Berkeley

Originally prepared by
Bill Lambert and Dave Fogarty
City of Berkeley Office of Economic Development
December 1988
Updated, October 2012

2180 MILVIA ST
BERKELEY, CA 94704

DOCUMENTATION OF LINKAGE BETWEEN COMMERCIAL AND INDUSTRIAL DEVELOPMENT IN BERKELEY AND NEED FOR LOW AND VERY-LOW INCOME HOUSING IN BERKELEY

NOTE ON THE OCTOBER 2012 REVISION

On May 3, 2011, the City Council directed staff "to conduct studies to update the fees and other relevant aspects of the Resolutions[1] that imposed the <housing and child care mitigation> requirements in 1993." This necessarily means revising and updating the two "nexus" studies completed in December 1988 that established the basis for the fees by analyzing the relationship between added workspace in Berkeley and the need for affordable housing and affordable child care.[2] The studies showed how newly constructed workspace (retail, restaurant, hotel, office and industrial) brought new employees to Berkeley, a certain proportion of whom would want to live in Berkeley, with some proportion of those needing affordable housing and affordable child care. The studies established the quantitative dimensions of this chain of reasoning and, based on the cost of building affordable housing and providing affordable child care, calculated the fee that it would be reasonable to charge developers of each major type of workspace to "mitigate" the impacts on the housing and child care markets in Berkeley. Since the nexus studies preceded the enactment of the housing and child care mitigation resolutions by nearly five years and most of the data used in them was even older, the basis for the fees may have been somewhat out of date when they were enacted in 1993.

Nineteen years later they are certainly obsolete. Nevertheless, as the Council also noted on May 3, the basic relationship between adding workspace and increased demand for affordable housing and child care remains valid. This is underscored by the fact that since Berkeley enacted its mitigation programs in the early 1990s, dozens of other cities around the country have enacted similar "linkage" fee programs. Review of a sample of recent "nexus" studies for other cities shows that they follow the same, or at least similar, calculation procedures as the 1988 Berkeley studies, although the ones for larger cities use much more elaborate methodologies. The basic framework for the original study is therefore not out-of-date, which is why we have elected to retain the same title, most of the same calculation steps, and even some of the same language as the original study. The

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[1] Resolution No. 56,912-N.S. Establishing a requirement that applicants for large scale office, retail, industrial, and/or other commercial development projects located in all non-residential and R-4 zones, excepting projects in the South Berkeley Title IX Target Area, offset the project's impacts on affordable housing. Resolution No. 56,913-N.S. Establishing a requirement that applicants for large scale office, retail, industrial, and/or other commercial development projects located in all non-residential and R-4 zones, excepting projects in the South Berkeley Title IX Target Area, offset the project's impacts on affordable child care.

[2] *Documentation of Linkage between Commercial and Industrial Development in Berkeley and the Need for Low and Very-Low Income Housing in Berkeley*, prepared by Bill Lambert and Dave Fogarty, City of Berkeley Office of Economic Development, December 1988; *Documentation of Linkage between Commercial and Industrial Development in Berkeley and the Need for Affordable Child Care in Berkeley*, prepared by Bill Lambert and Dave Fogarty, December 1988.

updating largely involved providing the most recent available data for the same calculation steps as in the original. However, when more recent studies employ what seem to us a clearer or more accurate way of determining a quantitative relationship, we have not hesitated to use it in place of the old step. Thus we use a table from the recent City of Berkeley *Affordable Housing Fee Nexus Study*[3] to calculate the percent of households in lower income ranges by type of industry (Step 5 below) because it is much more geographically and industry-specific than the method used in the original study. For all steps, we attempt to explain why we chose the particular reasoning and data elements to demonstrate the relationship.

Economic and social changes since the 1980s require us to re-examine some of the relationships postulated in the original study. The 1988 version calculated that 30% of those who work in Berkeley also lived here but this had to be reduced to 17% in the current version (Step 2). The 1988 study also estimated that, of the new jobholders who ended up living in Berkeley, some 70% would have moved from somewhere outside Berkeley (Step 4: Estimate of employees who will move to Berkeley). That assumption was perhaps justified in the late 1980s when the local labor market was "tight", with relatively low unemployment, a condition that persisted until the recession of 1993-1994. However, current and projected high levels of unemployment in California mean that most employers can choose among many qualified locally-based job seekers and have less need to hire people who would need to move here.[4] An indicator of this is that net migration into Alameda County has been negative (-51,114) since 2000[5], a condition that is likely to continue at least as long as California unemployment is higher than the national average. This contrasts dramatically with the situation in the late 1980s when net migration into California as a whole and Alameda County in particular was high. We have therefore had to develop our own new lower estimate for the proportion of new Berkeley job holders in the private sector who can be presumed to move to Berkeley because of employment here (Step 3).

Changes in City policies that are themselves partly the product of the changed economic environment since the 1980s made it necessary to reconsider other aspects of the study. The original analysis (Step 1) used the following types of workplaces: Office, Retail (excluding restaurants), Restaurants, Industrial/manufacturing, and Hotel/lodging.[6] Recent

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[3] Table B:2: *Income Level by Industry: Persons in 2000 by 2009 Income Limits*, p. 34 of the *Affordable Housing Fee Nexus Study*, submitted to the City of Berkeley, October 2010 by Bay Area Economics and included as Attachment 1 to the Housing Department's report to the City Council, January 25, 2011 and also February 16, 2011.

[4] In 1988, unemployment in Berkeley was under 5% compared to over 10% in 2011. High unemployment is projected to persist for at least until 2014.

[5] *State of California, Department of Finance. Population Estimates and Components of Change by County, July 1, 1999-2010. Sacramento, California, August 2011.*

[6] Without any explanation (but presumably for administrative simplicity), the Resolution establishing housing mitigation fees collapsed the 5 types of workplace into two categories and fee levels: "office/and/or retail) at $4.00 per sf and "industrial" at the lower rate of $2.00 per sf. An attachment to the Resolution (Exhibit B) defines as "retail", "office" and "industrial" industries that certainly didn't and don't belong there by either the former Standard Industrial Classification (SIC) system in effect at the time or the North American Industrial Classification System (NAICS) that has been in effect since 2000.

City economic development and attraction policies place an emphasis on construction of new space for research and development, particularly for start-up businesses created from research at UC Berkeley or Lawrence Berkeley National Laboratory. The current revision has needed to consider how R&D space should be assessed: i.e., whether it can fit into one or more of the old workplace categories or should be considered a new type of workspace and analyzed separately.

The 1988 study limited itself to establishing a procedure for calculating the housing subsidy that would be owed by individual projects based on a calculation of the number of very-low and lower income employees who could be presumed to work and live in Berkeley. It did not complete this with a statement of the maximum legally justifiable fees that could be charged per square foot by type of development project which, based on U.S. Supreme Court decisions, is the usual purpose of Nexus studies. Because of requirements resulting from these decisions and California Code Section 66000 et. seq., the current study does estimate legally justifiable maximum fees. However, this should not be understood to be a recommendation to the Berkeley City Council on the actual fee levels which it should enact. In order to do that, the Council will have to consider market conditions, economic feasibility, and fee comparisons with other cities which are issues beyond the scope of this report.

Introduction

Urban economic theory holds that there is a clear relationship between the addition of buildings where people are employed and the demand for housing. If the new buildings add workspace and increase net employment, they will attract new workers to the area whose households will, in turn, impact the local housing market. The additional demand may induce builders to construct some amount of new housing, but it will also make existing housing more expensive. The increased cost and diminished availability of housing will have its greatest effect on low and moderate income households, who can least afford it.

In 1981 San Francisco began its Office-Housing Production Program (OHPP) which required developers to "mitigate" the housing market impact of new downtown office buildings by constructing or paying for new housing units. Subsequently, these employment-housing "linkage" programs have been adopted by various other U.S. cities, including Boston, Santa Monica, Seattle, San Diego and Miami.[7] Such programs usually focus on the provision of affordable housing for low-and moderate-income people—housing at purchase prices and rents below those needed to cover the costs of new construction and which developers will therefore not build without a subsidy. The logic of most jobs-housing linkage programs holds that expanding the housing supply in the lower price and rent ranges will do the most to mitigate the impact on the housing market from the influx of new workers, since they would otherwise compete with existing residents for the limited stock of affordable housing.

This document calculates the number of new low-and very-low income households that can be expected to move to Berkeley and look for housing here as a result of household members obtaining jobs here whose creation was facilitated by the development of various types of new commercial and industrial workspace. It also calculates the subsidy required to build the additional units of affordable housing that would be required to meet the new demand for housing affordable to households in these income ranges. Finally, it calculates a fee per square foot of new commercial and industrial space that it would be reasonable to charge developers in order to obtain the revenue needed to build affordable housing to offset the new demand.

The analysis proceeds in steps, with each containing a discussion of the basis for assumptions and documentation for the numbers used in calculations. As with many other nexus studies, we assume a prototypical 100,000 sq. ft building intended for different uses (retail, office, industrial, etc.) These steps are:

1. Determine average employment at full occupancy for different types of non-residential buildings or prototype workplaces (100,000 sf).
2. Calculate the number of new employees by each workspace type who will reside in Berkeley (i.e., who already live here or who will move here.)

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[7] By Area cities with linkage programs include Palo Alto, Menlo Park, Mountain View, Corte Madera, Sunnyvale, Livermore, Pleasanton, Walnut Creek and Alameda.

3. Calculate the proportion of new employees who can be expected to move to Berkeley (and therefore have an impact on the housing market here.)
4. Estimate number of new households represented by this number of employees.
5. Estimate percent of lower income households (i.e., those requiring a housing subsidy) for each type of workplace.
6. Divide by 100,000 square feet to arrive at coefficients of housing units per square feet of building area.
7. Calculate housing subsidy required to build housing affordable to low and very-low income households.
8. For each building type, multiply the number of households per square foot by the costs of delivering housing units affordable to these income groups.

STEPS

1. Determine average employment at full occupancy in different types of non-residential buildings or prototype workplaces (100,000 sf)

The first step estimates the number of employees who will work in each building prototype at full occupancy. This involves dividing the size of the building (100,000 sf) by the average number of square feet per worker ("employment density") in each major type of workspace.

OED's 1988 employment densities are in column 2 below and the proposed revisions are in column 3. Proposed new categories are in bold.

Type of Building	PAS Density	Proposed 2011 Density
Office	275 sq. ft. per employee	250 sq. ft. per employee
Retail	500 sq. ft. per employee	500 sq. ft. per employee
Restaurant[8]	170 sq. ft. per employee	500 sq. ft. per employee
Industrial/manufacturing	1000 sq. ft. per employee	500 sq. ft. per employee
Hotel/lodging	1000 sq. ft. per employee	500 sq. ft. per employee
Warehouse/storage	N/A	1000 sq. ft. per employee
Research and Development	N/A	500 sq. ft. per employee

[8] The 1988 nexus studies used "Restaurant" as a separate category for analysis but the fee Resolutions collapsed it into the Retail category. We believe that this is logical because developers of new buildings in Berkeley plan for generic retail space but only rarely permit, let alone equip it, specifically for a restaurant. The decision to do this is left to the future tenant. Therefore, except in rare instances, the staff that administers the mitigation fees has no way of knowing how much, if any, of the planned retail space will become restaurant space. None of the other nexus studies use "restaurant" as a separate category but generally include it in retail.

In revising the employment density estimates for Berkeley, staff consulted a variety of sources: recent nexus studies for other cities in California (e.g., San Diego, Walnut Creek); published discussions of employment density trends[9]; and government statistics.[10] In order to take into account specific occupancies in Berkeley, staff sampled a certain number of Berkeley buildings and employers. [11]

Office In line with national trends, office employment in Berkeley offices appears to have become *somewhat* more dense though this has been constrained by the fact that, by national standards, all office buildings here are relatively small, which means they have a higher proportion of corridors, elevators and other "general" use space in relation to actual workspace. This raises the average amount of office space per worker. We have therefore decreased the amount of square feet per worker in the office sector only slightly, from 275 sf to 250 sf.

Retail There is no doubt that Berkeley retail space is more intensively occupied than the national average which was shown to be 901 sf per worker in a 2003 government survey.[12] This higher density (i.e., fewer square feet per worker) is because we have a high proportion of small storefront retailers and, none of the large "superstores" that usually have more than a thousand square feet per employee. In addition, for reasons explained in footnote 9 on the previous page, restaurants, which typically have a high employment density (less than 200 sf per employee) are considered a Retail land use even though the federal government now classifies them in a different economic sector.[13] Nevertheless, three factors work against decreasing the amount below the 500 sf per employee estimated in 1988. First, since 2000 retail employment density in Berkeley has likely decreased because the number of employees in the sector has steadily declined from 6,548 in 492 establishments in March 2001 to 5,063

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[9] Bob Johnson, *Floorspace Per Employee: An Elusive Prey*, Bob Johston, CalPECAS Peer Advisory Team Mtg., San Francisco, CA March 24, 2010. (available on Internet); "Office walls are closing in on corporate workers" by Roger Vincent, Los Angeles Times, December 15, 2010; "Office Personal Space Is Crowded Out" by Sarah Needleman, Wall Street Journal, December 7, 2009.

[10] U.S. Energy Information Administration, *2003 Commercial Buildings Energy Consumption Survey: Building Characteristics Tables Revised June 2006.* Table B1. Summary Table: Total and Means of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003. This only official survey shows higher "mean square feet per worker" than other sources. Unfortunately, the Energy Information Administration has discontinued this survey.

[11] Businesses are asked to give the number of employees, including owners active in the business, on the business license form that they return every year. Property records show the total area of buildings, allowing a calculation of employment density when we have been able to obtain a list of all businesses in a building. In practice, these calculations have themselves had to be adjusted to account for part-time employees. (The question on the business license form does not distinguish between fulltime and part-time employees.)

[12] U.S. Energy Information Administration, *2003 Commercial Buildings Energy Consumption Survey: Building Characteristics Tables Revised June 2006.* Table B1. This figure was attained by combining the survey's categories for Food Sales, Food Service and Retail (Other than Mall).

[13] With the introduction of the North American Industrial Classification System in 2000, the federal government moved restaurants to a new sector, Accommodation and Food Services, from Retail where it had been in the foerm Standard Industrial Classification.

in 449 establishments in March 2009. [14] In that time period, the average number of employees per establishment diminished from 13.3 to 11.3, which strongly suggests that the average amount of space per worker may have increased. In addition, partly because Berkeley has a large student population, a very high proportion of retail employees here are part-time, which means that the effective number of employees working at any one time is much less than the number of employees reported to statistical agencies. As a control, staff has sampled the few new retail projects in Berkeley that have been assessed the mitigation fee and determined that 500 sf per employee is a reasonable figure for new retail projects that have been built since the late 1980s. This implies that in Berkeley small "storefront" retail is overbuilt and new projects are likely to be large single-purpose stores with a relatively low density of employment.

Industrial/manufacturing The 1988 analysis determined the employment density of this type of building at 1,000 sf per worker, but with a note (p.2) saying "altered from 500 sq. ft. 4/91 based on local empirical evidence." This may be due to the fact that warehousing and wholesale trade,, which have a very low density of employment, were included in the "Industrial/manufacturing" category. However, most recent jobs-housing nexus studies assign an employment density of 500 sf per worker to manufacturing/industrial buildings and consider it a separate land use from Warehousing and wholesale trade.

For verification, we attempted to compare reported manufacturing employment in Berkeley with the amount of building area reported as "manufacturing." The commercial brokerages (Cassidy-Turley, CB Richard Ellis) report about 4,500,000 sf of occupied "manufacturing" space in Berkeley. They categorize these buildings solely on physical characteristics[15], however, not on the actual type of firm that occupies them, which may or may not be a manufacturer. The latest Economic Census for Berkeley says that there were 4,733 workers employed in manufacturing in Berkeley in March, 2007 (i.e., prior to the recession.) If we accept the commercial brokerages' figure for the amount of manufacturing space, the average area per worker would be about 950 sf. However, the commercial real estate information company CoStar says that there is about 2,068,035 square feet of manufacturing space in Berkeley.[16] If this is more accurate figure, as I believe it is, the average amount of space per manufacturing worker in Berkeley would be 436 sf and for manufacturing *production* workers, 682 sf.[17] It therefore seems reasonable to adopt the 500 sf per worker standard.

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[14] Table II: *Number of Retail Employers, Size of Retail Employment and 1st Quarter Payroll. City of Berkeley, 1st Quarter 2001-1st Quarter 2009* in the Information Report to the City Council by Michael J. Caplan, Economic Development Manager, October 26, 2010, Decline in Taxable Retail Sales in Berkeley with Corresponding Decline in City Revenue from the State Sales Tax.

[15] For the commercial brokerage firm Cassidy-Turley, manufacturing buildings are defined as those with a parking ratio of less than 3 spaces per 1,000 sf, clear height of less than 18 feet, three sides of concrete and one of glass, and low (6-15) percent of office build-out. Cf Cassidy-Turley/BT Commercial, *Manufacturing Report East Bay*

[16] Figure communicated by staff in Sustainable Development who had a temporary subscription to CoStar.

[17] Of the 4,733 people employed in manufacturing in Berkeley in 2007, only 3,032 were characterized by the Census Bureau as "production" workers. The remaining 36% were administrators,
(footnote continued)

Hotel/lodging Recent nexus studies (e.g. San Diego and Walnut Creek) have adopted a standard of 1 employee for every 500 square feet. A verification based on Berkeley's three largest hotels (Doubletree with 378 rooms, Hotel Shattuck Plaza with 199 and the Durant Hotel with 143) shows that this standard is appropriate for mid-market hotels in Berkeley, though it would have to be adjusted for budget or limited-service hotels or motels, which have fewer employees by area, or for a projected luxury hotel which would have more.

Warehouse/storage We have adopted the standard of one employee for every 1000 square feet because OED studies have shown that the use of warehouse buildings in Berkeley is relatively intense because lease rates for warehouse space are higher here than elsewhere in the East Bay. Some recent nexus studies (e.g., San Diego) have used the standard of one employee for every 2,000 sf, which would be appropriate for some low-intensity uses such as mini-storage facilities in Berkeley.

Research and Development Berkeley recently adopted zoning changes to encourage start-up technology businesses emerging from UC Berkeley and Lawrence Berkeley National Laboratory. In some cases, this will involve construction of new buildings intended for Research and Development or conversion of warehouses for this purpose. Commercial real estate brokerages regard R&D space as industrial space enhanced with a somewhat higher proportion of office space and amenities such as more parking and glass external walls.[18] Berkeley's own definition of R&D emphasizes that it is a *non-office* use engaged in "one or more of the following activities: industrial, biological or scientific research; product design; development and testing; and limited manufacturing for the production of prototypes." Since it is defined as a variant of industrial property, it seems appropriate to assign it the same employment density as Manufacturing/industrial, 500 sf per employee. Some R&D (e.g., software development) is office-based and should be evaluated as office space.

These density factors are intended to be averages for the lifetime of typical buildings in Berkeley, though individual buildings may diverge particularly when they are designed for particular occupants. The fee Resolution will make provision for special treatment when a developer can demonstrate that the employment impact of his building will differ from the average density for the building type.

Using the density factors listed above, at full occupancy the prototype 100,000 sf buildings would house the following number of employees:

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researchers, clerical, etc (i.e., office employees). For production workers as distinct from all manufacturing employee), the average amount of space is 682 sf.

[18] Cassidy Turley BT Commercial defines R&D "product" as "Buildings typically used for R&D purposes that maintain the following: 3/1000 parking or greater, no more than two stories, clear height less than 18', three sides of glass, usually improved with mixture of office, manufacturing and assembly. CB Richard Ellis (CBRE) defines R&D space as "Industrial buildings with less than or equal to three stores and at least 25% but less than 75% of the Net Rentable Area is demised or planned as office space or highly improved and a parking ration greater than or equal to 2.5:1. Frequently known as "Flex" space, as it can serve multiple "office" space needs as well."

Type of Building	Employment Density/employee	Number of Employment at Full Occupancy (1000 sq ft/ Emp. Density)
Office	250 sq. ft.	400
Retail (including Restaurant)	500 sq. ft.	200
Industrial/manufacturing	500 sq. ft.	200
Hotel/lodging	500 sq. ft.	200
Warehouse/storage	1000 sq. ft.	100
Research and Development	500 sq. ft.	200

In this analysis we treat a project's net addition of new business space as an incremental contribution to the total space available for economic activity in Berkeley over an extended period of time. The addition of new space for commercial activity accommodates employment growth in Berkeley, but it should be understood that the "new" business and employment is not necessarily located in the new project buildings themselves. A firm or firms already in Berkeley may move into that space, leaving its former space to be occupied by a new firm. A chain of moves triggered by the new commercial space ends by allowing the same employment growth to occur as if a business new to Berkeley had moved into the new space. In addition, the new building can be expected to have various (and perhaps many) tenants during its lifetime, so it would be unreasonable to link the mitigation requirements too closely to the characteristics of the project's first tenant(s).

2. Calculate number of employees who will live in Berkeley as a result of the increase in workspace and employment

The next step is to estimate the number of employees who will reside in Berkeley as a function of the increase in the number of jobs. (This number includes both those who already lived here at the time they obtained a new job that was triggered by workplace expansion and those who move to Berkeley as a result of obtaining such a job.)

Only a fraction of the new employees who will work in Berkeley as a result of the addition of new business space can be expected to also live here because Berkeley is part of a much larger labor market/commute area. The 1988 nexus study estimated that fraction to be 30%. However, the percent of Berkeley workers who live in Berkeley has declined further since then, probably because fewer employees can afford to live here when home prices and rents tend to be higher than in other parts of the commute area. A recent study using Census Bureau data showed that "the percentage of all Berkeley workers who live in the City of Berkeley has declined over time—from 21.2% in 2002 to 16.8% in 2009."[19] We therefore

[19] These figures were extracted from the Longitudinal Employer-Household Dynamics (LEHD) data set of the U.S. Census Bureau by Department of City and Regional Planning students Sean Carnion, Kerry Fleisher, Brad Johnson, Anna McCorvey, Salma Mousallem, and Alison Nemirow for a study *(footnote continued)*

estimate that 17% of new jobs would go to people who either already live in Berkeley or who would move here as a result of being employed in the new economic activity accommodated by new business space. The projections for employment by end-use workplace type (Step one, above) should be multiplied by .17 to obtain the number of new employees projected to reside in Berkeley:

Type of Building (100,000 sf prototype)	Employment at Full Occupancy	Number of Employees Who Will Live in Berkeley (x 0.17)
Office	400	68
Retail (including Restaurant)	200	34
Industrial/manufacturing	200	34
Hotel/lodging	200	34
Warehouse/storage	100	17
Research and Development	200	34

3. Calculate the proportion of new employees who can be expected to move to Berkeley (and therefore have an additional impact on the housing market here.)

The employees who already lived in Berkeley at the time they obtain a new job here obviously do not have an impact on the housing market here. It is the new employees who move to Berkeley as a result of accepting employment here that create increased demand in the housing market. This step must project how many they are even though we lack direct statistical evidence to do this and must limit ourselves to revising the conclusions of the 1988 study based on what evidence does exist.

The 1988 version of this study estimated that the split would be 30% already resident and 70% who would move here. The fact that the proportion of Berkeley-resident employees declined from 41.1% in 1980 to 16.8% in 2009 reflects the fact that historically the housing vacancy rate in Berkeley tends to be lower, and units somewhat higher priced, than in other comparable areas within commuting distance.[20] This is the "structural" reason why over time a lower and lower proportion of our workforce resides in Berkeley: because of higher housing costs here, people newly hired into Berkeley-based jobs who might want to move closer to their worksite decide to stay where they are if they within commuting distance and, if they do move, they are less likely to find housing in Berkeley itself than in other nearby communities. On the other hand, under current and foreseeable conditions a persistently high level of unemployment means that, for any job vacancy in Berkeley, there will be more qualified job applicants who are already resident within commuting distance (though not necessarily in Berkeley) and who will not need to move here if they are hired. We would therefore expect that a somewhat lower proportion of new employees who live in Berkeley would be people who moved here because of their new job than the 70% estimated in 1988.

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undertaken for the City of Berkeley Commission on Labor, Bayer & the City of Berkeley, May 2, 2011.

[20] Housing developers estimate that, for units of comparable size and quality, the market rent tends to be between 25% higher near campus and 10-15% higher elsewhere in Berkeley than other areas in the East Bay.

It seems reasonable to estimate that the split would now be more like 50% people who already lived here prior to obtaining a job and 50% people who would move here. We therefore apply a .5 reduction factor to the results of Step 2:

Type of Building (100,000 sf prototype)	Number of Employees Who Will Live in Berkeley	Number of Employees Who Will Move to Berkeley (x .5)
Office	68	34
Retail (including Restaurant)	34	17
Industrial/manufacturing	34	17
Hotel/lodging	34	17
Warehouse/storage	17	8.5
Research and Development	34	17

4. Conversion of employees to employee households

The steps up until now have yielded estimates of the number of workers, by type of workplace, who will be attracted to the Berkeley housing market by new jobs created in Berkeley. However, the unit that competes for housing is the household, and housing assistance programs are based on household income and household size. Statistically, over time fewer new households will be attracted to Berkeley by new jobs because many households now include more than one worker.. The relevant number is the average number of workers per worker households. Worker households are those that include at least one working member and therefore excludes households made up solely of students retired people, or the unemployed. According to the American Community Survey, the average worker household in Berkeley comprised 1.55 earners in 2010, an increase from 1.38 used in the 1988 study..[21] This factor allows us to calculate the number of households who will move to Berkeley because of the expansion of jobs due to added workspace by dividing the number of employees expected to move by the average number of workers per employed household:

Type of Building (100,000 sf prototype)	Number of Employees Who Will Move to Berkeley	Number of Households Who Will Move to Berkeley (/1.55)
Office	34	22
Retail (including Restaurant)	17	11
Industrial/manufacturing	17	11
Hotel/lodging	17	11
Warehouse/storage	8.5	5.5
Research and Development	17	11

5. Calculation of lower income employee households who require housing assistance

This step projects the number of households that fall into lower income categories that require housing assistance. The 1988 study and most Nexus studies accomplish this task by

[21] Table B08202, Household Size by Number of Workers in Household.. The 1988 figure was derived from the 1980 Census.

1) estimating the occupational distribution of employees in the various workplace types; and then 2) translating this into estimates of employee households meeting the lower income definitions using wage and salary information from the State of California Employment Development Department. The only source for the first step is a national matrix of industries and occupations by the Bureau of Labor Statistics. For large cities with many large employers this source may yield generally accurate results but it is probably much less valid for a city like Berkeley which includes primarily small employers. We have therefore chosen to use a different, more direct method that we believe yields more valid results for the Berkeley labor market. On its website, the U.S. Census Bureau makes available a Public Use Microdata Sample (PUMS) from the decennial Census and other surveys that allow users to perform cross-tabulations for relatively small areas such as Berkeley (PUMS area 02401.) For its *Affordable Housing Free Nexus Study* prepared for the City of Berkeley in 2011, consultant Bay Area Economics used PUMS data from the 2000 Census to estimate household incomes as a percent of Area Median Income by NAICS industrial sectors. The table controls for household size and adjusts income to the 2009 HUD Household Income Limits for Alameda County.

The HUD income categories are based on a percentage of Area Median Income:

- Extremely Low-Income: Up to 30% of AMI
- Very Low-Income: 31% to 50 percent of AMI
- Low-Income 51 percent to 80% of AMI
- Moderate-Income: 81% to 120% of AMI
- Above-Moderate Income: More than 120% of AMI

The table prepared by Bay Area Economics for the City of Berkeley allows us to estimate the percent of Berkeley employee households who fall into these HUD income categories. Please see Appendix A for the detailed table. The percent of lower income employees can be taken directly from this table for workspace categories Manufacturing/industrial and Warehouse/storage. This cannot be done so easily, however, for Retail Trade/restaurants, Hotel/lodging, Research and Development and Office where, for various reasons, the workspace categories do not completely correspond to discrete NAICS sectors represented in the table. We have therefore made adjustments that are explained in the Appendix to establish conservative estimates for the percent of households in the lower income ranges for these workplace categories.

The *Affordable Housing Fee Nexus Study* compared Berkeley rents to Berkeley household incomes by household size using the HUD standard that households can afford to pay up to 30% of their income for rent. This study concluded that moderate-income households and above can afford to pay market rents and that "only households earning up to 65 percent of AMI require rental housing assistance in Berkeley."[22] The table below summarizes the percent of total new worker households by industry that fall into the lower income ranges below 65% of AMI:

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[22] *Affordable Housing Fee Nexus Study*, submitted to the City of Berkeley, October 2010 by Bay Area Economics and included as Attachment 1 to the Housing Department's report to the City Council, January 25, 2011 and also February 16, 2011. The quoted statement is on p. 20 of the Study.

Percent of Households at Lower Income Levels by Type of Workplace						
Income Levels	Office	Retail/ Restaurant	Mfg./ Industrial	Hotel/ Lodging	Warehouse/ Storage	R & D
Extremely Low Income (under 30% AMI)	5.05%	11.7%	5.4%	13.8%	6.6%	4.9%
Very Low Income (30%-50% AMI)	5.3%	12.3%	7.3%	14.3%	9.1%	5.3%
Low Income (50%-68% AMI)	4.54%	8.3%	6.0%	9.2%	6.7%	**4.6%**

Applied to the total number of new households attracted to Berkeley by new jobs (from Step 4), the table allows us to calculate the number of lower income households moving to Berkeley by type of workplace:

Calculation of Number of Lower-Income Households Moving to Berkeley by Type of Workplace

Calculation of Households with Incomes under 30% of Area Median Income Who Will Move to Berkeley						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodg.	Warehouse	R&D
Total Households Moving	22	11	11	11	5.5	11
% of HH under 30% of AMI	5.05%	11.7%	5.4%	13.8%	6.6%	4.9%
No. of HH Under 30% of AMI	1.1	1.3	0.6	1.5	0.4	0.5

Calculation of Households with Incomes 30%-50% of Area Median Income Who Will Move to Berkeley						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodg.	Warehouse	R&D
Total Households Moving	22	11	11	11	5.5	11
% of HH 30% - 50% AMI	5.3%	12.3%	7.3%	14.3%	9.1%	5.3%
No. of HH 30% 50% of AMI	1.2	1.4	0.8	1.6	0.5	0.6

Calculation of Households with Incomes 50%-65% of Area Median Income Who Will Move to Berkeley						
	Office	Retail/Res	Mfg./Ind.	Hotel/Lodge	Warehouse	R&D
Total Households Moving	22	11	11	11	5.5	11
% of HH 50%-65% of AMI	4.54%	8..3%	6.0%	9.2%	6.7%	4.6%
% of HH 50%-65% of AMI	1.0	0.9	0.7	1.0	0.4	0.5

6. Divide by 100,000 to translate the number of households to a per-square-foot basis by type of workplace.

The analysis so far has used prototype 100,000 sf buildings but the final product needs to be a recommendation for maximum fees that could be charged on a square-foot basis for buildings of any size. We therefore need to convert the household figures from Step five into per-square-foot coefficients by type of workspace. This is accomplished by dividing the household figures from Step five by 100,000. In effect, the resulting coefficients express the fractional portion of a household, or housing unit, by affordability level that is associated with each square foot of building area.

COEFFICIENTS FOR NUMBER OF LOW-INCOME HOUSEHOLDS PER SQUARE FOOT OF BUILDING AREA BY TYPE OF BUILDING OR WORKPLACE						
Household Income	Office	Retail/ Restaurant	Mfg./ Industrial	Hotel/ Lodging	Warehouse/ Storage	Research & Development
30% AMI	1.1/100,000= 0.0000110	1.3/100,000 = 0.0000130	0.6/100,000 = 0.0000060	1.5/100,000 0.000015	0.4/100,000= 0.0000040	0.5/100,000= 0.0000050
30% - 50% AMI	1.2/100,000= 0.0000120	1.4/100,000 = 0.0000140	0.8/100,000 = 0.0000080	1.6/100,000 = 0.000016	0.5/100,000= 0.0000050	0.6/100,000= 0.0000060
50% 65% AMI	1.0/100,000= 0.000010	0.9/100,000 = 0.0000090	0.7/100,000 = 0.0000070	1.0/100,000 = 0.000010	0.4/100,000= 0.0000040	0.5/100,000= 0.0000050

7. Calculate housing subsidy required to build housing affordable to households who require housing assistance to live in Berkeley

This has been done for us in the *Affordable Housing Fee Nexus Study*, pp. 22-23. The study determined that the average construction cost for an affordable unit in Berkeley was $275,000 and then calculated the Financing Gap per Affordable Unit for the three income levels Extremely Low Income (under 30% AMI), Very Low Income (30%-50% AMI), and Low Income (50%-65% AMI):

Table 4.4: Affordable Housing Impact Fee Calculation

Financing Gap Analysis				
Total Affordable Unit Dev't Costs per Unit	**$400,200**			**Source**
				Based on weighted avg construction costs for Affordable units in Berkeley Per City of Berkeley cost data Interviews with affordable housing developers
Financing Terms				
Debt Coverage Ratio	1.30			
Interest Rate	6.5%			
Term of Loan	30			
	Income Level as Percent of AMI			
	Up to 30%	**30% to 50%**	**50% to 65**	
Household Income Limit	$24,100	$40,200	$52,200	*Based on 3-person HH, CA Dept. of Housing & Comm. Dev.*
Affordable Monthly Rent Per Unit	$569	$911	$1,211	*30% of income to rent and utilities*
Operating Expenses	35%	35%	35%	*Interviews with affordable housing developers*
Vacancy	5%	5%	5%	*Interviews with affordable housing developers*
Net Operating Income Per Unit	$305	$547	$727	*Affordable Monthly Rent less Operating Expenses and Vacancy*
Monthly Supportable Debt Service per Unit	$235	$420	$559	*Previous row divided by Debt Coverage Ratio*
Loan Amount	$37,131	$66,522	$88,428	**Based on financing terms above**
Financing Gap per Affordable Unit	**$363,069**	**$333,678**	**$311,772**	**Total Dev't Cost less Loan Amount**
Units Demanded	3.5	3.8	2.7	*See Tablet 4.3*
Total Financing Gap	**$1,286,628**	**$1,268,822**	**$846,222**	**Product of prior row and Financing Gap per Affordable Unit**
Max. Impact Fee per 100-unit Development	**$3,401,671**			*Sum of columns in previous row*
Max. Impact Fee per Unit	**$34,017**			*Prior row divided by 100*

Sources: City of Berkeley, 2010; BAE, 2010

We have accordingly used $237,869 as the financing gap for Extremely Low Income households, $208,478 for Very Low Income households, and $173,064 for Low Income households.

8. For each building/workplace type, multiply the coefficients that express the number of lower-income households per square foot by the costs of delivering housing units affordable to these income groups

The final step combines the results of the analysis of the number of households qualified to receive low-income housing assistance by type of building with the findings of the previous step, which shows the cost of providing the subsidy required to house them in Berkeley ("Financing Gap per Affordable Unit"). This requires multiplying the number of households (or housing units, which amounts to the same thing) per square foot from Step 6 by the "Financing Gap" per housing unit from Step 7. This is done for each building type and income level. The results are then totaled for each building type to show the amount that should be charged per square foot to meet the affordable housing demand created by the addition of new workspace in Berkeley. This calculation is shown below:

TOTAL HOUSING NEXUS COST PER SQUARE FOOT BY TYPE OF BUILDING							
	Financing/ $SP/unit	Office	Retail/ Restaurant	Mfg./ Industrial	Hotel/ Lodging	Warehouse/ Storage	R & D
[illegible]	$363,069	0.000011x $363,069= $3.99	0.000013x $363,069 =$4.71	0.000006x $363,069 =$2.18	0.000015x $363,069 =$5.45	0.0000040x $363,069 =$1.45	0.000005x $363,069= $1.82
[illegible]	$333,678	0.000012x S333,678 =$4.00	0.000014x $333,678 =$4.67	0.000008x $333,678 =$2.67	0.000016x $333,678 = $5.34	0.000005x $333,678 = $1.67	0.000006x $333,678 =$2.00
[illegible]	$311,772	0.00001x $311,772 =$3.12	0.000009x $311,772 = $2.81	0.000007x $311,772 =$2.18	0.00001x $311,772 = $3.12	0.000004x $311,772 =$1.25	0.000005x $311,772 =$1.56
TOTAL		**$11.11**	**$12.19**	**$7.03**	**$13.91**	**$4.37**	**$5.38**

These fee levels are our estimate of the legally justifiable maximum housing impact fee that *could* be charged on commercial development in Berkeley. The analysis is carried out to meet the requirements of California Code Section 66000 and several U.S. Supreme Court decisions. It is **not**, however, a recommendation on actual fees that should be charged. A decision on actual fee levels needs to be accompanied by information on market conditions in Berkeley and the economic feasibility of development projects in current conditions.

Appendix A.

Table B 2: *Income Level by Industry*, above, can be used to determine the percentage of employee households who require housing assistance (i.e., whose incomes are below 65% of AMI) for two of the workspace types identified in Step 1, above:

Manufacturing/industrial: NAICS 31-33 Manufacturing
Warehousing/storage NAICS 42, Wholesale Trade[23]

The workspace categories: *Office*, *Retail Trade/Restaurants*, *Hotel/Lodging*, and *Research and Development*, however, do not correspond to discrete NAICS sectors represented in the table. The discussion below explains what we have done to establish conservative estimates for the percent of households in the lower income ranges for these workplace categories.

- *Retail Trade/restaurants.* Retail Trade, NAICS 44-45, is a NAICS sector and household incomes are displayed in the table. Restaurants, however, are represented in the table as part of a larger consolidated sector, Arts, Entertainment and Recreation and Accommodation and Food Services, NAICS 71-72, which has a significantly higher proportion of workers with low household incomes than does NAICS 44-45. The 2007 Economic Census results for Berkeley indicates that "Food Services" (i.e., Restaurants) are primarily responsible for lower employee household incomes in NAICS 71-72.[24] The same Census also shows that the entire Berkeley Retail Trade Sector, NAICS 44-45 has only a few more employees (5,975) than are employed in Berkeley restaurants (5,026). Based on these two facts, it seems reasonable to estimate the household income for the Retail/restaurant workplace by splitting the difference between the household incomes of Retail Trade, NAICS 44-45, and that of the consolidated sector that includes restaurants, NAICS 71-72. Based on this principle, we estimate 11.7% of Retail/Restaurant household incomes

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[23] In principle Warehouse/storage space could be either or both NAICS 42, Wholesale Trade or the "warehousing" portion of NAICS 48-49, Transportation and Warehousing. However, employment figures from the EDD show that in Berkeley NAICS 48-49 had only 159 employees in 2010 compared to 1,282 in Wholesale Trade, NAICS industry 42. The NAICS subsector for "Warehousing and storage"(NAICS 493) comprises facilities that store goods only but "do not sell the goods they handle." As distinct from Wholesale Trade facilities, "Warehousing and storage" is barely if at all present in Berkeley. (Note that "Lessors of Miniwarehouses and Self-Storage Units" (NAICS 531120) is classified in Real Estate and Rental and Leasing, NAICS 53.) It therefore seems reasonable to project the income levels of Warehouse/storage workers in Berkeley on the basis of the household incomes of workers in Wholesale Trade, NAICS Sector 42.

[24] The 2007 Economic Census shows that in Berkeley "Accommodation and Food Services", NAICS 72, had nearly 4 times as many employees as "Arts, Entertainment, and Recreation", NAICS 71: 5,666 as against 1,434. And within NAICS 72, Food services and drinking places, NAICS 722, had many more employees than Accommodation (i.e., hotels and motels), NAICS 721: 5,026 as against 640. Therefore, the consolidated sector 71-72 in Table A is dominated by restaurant employment which must be responsible for the lower household incomes in the sector as a whole.

are Extremely Low Income (under 30% AMI); 12.3% are Very Low Income (30%-50% AMI); and 8.3% Low Income (50%-65% AMI).

- *Research and Development* (R&D) does not correspond to a single NAICS sector in the table but a composite can be derived starting from the definition of R& D in the Berkeley Zoning Ordinance:

> An establishment comprised of laboratory or other non-office space, which is engaged in one or more of the following activities: industrial, biological or scientific research, product design; development and testing; and limited manufacturing necessary for the production of prototypes.

This form of R&D will clearly have a mix of scientists and engineers with skilled workers or technicians similar to industrial workplaces. We assume that 75% of the employees will be Professional, Scientific and Management (NAICS 54-55) and 25% of the employees will be Manufacturing (NAICS 31-33) and adjust the income distribution for the workplace type accordingly. This leads to an estimate of R&D household incomes as 4.9% Extremely Low-Income 9 (under 30% AMI), 5.3% Very Low Income (30%-%0% AMI); and 4.6% Low Income (50%-65% AMI).

- *Office.* "Office" is a straightforward land-use category but it is somewhat difficult to define in NAICS. It clearly includes all, or nearly all, of some entire sectors (51, Information, 52, Finance and Insurance, 53, Real Estate and Rental and Leasing, and 54-55, Professional and Technical Services and Management of Companies and Enterprises. However, the 2007 Economic Census and the Quarterly Census of Employment and Wages (California EDD) show that in Berkeley Professional and Technical Services and Management (4,962 employees) is by far the largest, followed by Information (1635 employees), Finance and Insurance (1082), and Real Estate and Leasing (766). We have arrived at an income distribution for Office by weighting the NAICS sectors shown in the table according to their actual employment in Berkeley.[25] This leads to an estimate of 5.05% of office employee households as Extremely Low Income (under 30% AMI); 5.3% Very Low Income (30%-50% AMI); and 4.54% Low Income (50%-65% AMI).
- *Hotel/Lodging.* Accommodation (i.e., hotels, motels and other transient lodging) appears in NAICS sector 72 with Food Services but, as already explained above, for real estate purposes, "Food Services" (i.e., Restaurants) need to be treated as a retail land use. However, overall employee incomes in the Accommodation sector are nearly as low as those in the restaurant industry and Arts, Entertainment and

[25] 59% for Professional and Technical Services and Management; 19% for Information, 13% for Finance and Insurance, and 9% for Real Estate.

Recreation is not much better.[26] As a result, we have used the household income distribution of NAICS 71-72 for Hotel/Lodging workplaces: 13.8% Extremely Low Income (under 30% AMI); 14.2% Very Low Income (30%-50% AMI); and 9.2% (Low Income (50%-65% AMI).

The recent *Affordable Housing Fee Nexus Study* compared Berkeley rents to Berkeley household incomes by household size using the HUD standard that households can afford to pay up to 30% of their income for rent. This study for the City of Berkeley Housing Department concluded that moderate-income households and above can afford to pay market rents and that "only households earning up to 65 percent of AMI require rental housing assistance in Berkeley."[27] In the table on household incomes by workplace type below, 65% of AMI is therefore the critical threshold.

Table B.2: Income Level by Industry, Persons in 2000 by 2009 Income Limits

NAICS Code	Industry	Estimated Household Income as a Percent of AMI (a)					
		Up to 30% AMI	30% to 50% AMI	50% to 65% AMI	65% to 120% AMI	Above 120% AMI	Total
11, 21-22	Agriculture, Forestry, Fishing & Hunting, Mining, Utilities	10.7%	14.2%	7.5%	31.1%	36.1%	100.0%
23	Construction	9.6%	13.6%	8.1%	36.6%	32.1%	100.0%
31-33	Manufacturing	9.4%	7.4%	6.3%	30.4%	46.6%	100.0%
42	Wholesale Trade	6.6%	9.1%	6.7%	33.2%	44.5%	100.0%
44-45	Retail Trade	9.6%	10.3%	7.4%	34.2%	38.5%	100.0%
48-49	Transportation & Warehousing	8.4%	10.5%	7.1%	37.7%	36.2%	100.0%
51	Information	5.3%	5.4%	4.4%	27.0%	57.9%	100.0%
52	Finance & Insurance	4.5%	5.6%	5.3%	29.6%	55.4%	100.0%
53	Real Estate & Rental & Leasing	9.3%	9.1%	6.7%	29.9%	45.0%	100.0%
54-56	Professional & Technical Services, Management of Companies & Enterprises	4.7%	4.8%	4.1%	33.9%	52.4%	100.0%
55	Administrative & Waste Services	13.6%	14.0%	9.2%	34.8%	28.5%	100.0%
61	Educational Services	10.0%	7.6%	8.3%	30.8%	43.1%	100.0%
62	Health Care & Social Assistance	7.9%	9.2%	7.9%	32.4%	42.5%	100.0%
71-72	Arts, Entertainment & Recreation, Accommodation & Food Services	13.8%	14.2%	9.2%	34.6%	28.1%	100.0%
81	Other Services, except Public Administration	11.2%	13.3%	9.6%	34.5%	31.4%	100.0%
92	Government	6.9%	8.9%	8.6%	33.7%	42.0%	100.0%

Notes:

(a) Based on a 5% tabulation of 2000 Public Use Microdata Sample (PUMS) from the US Census. 1999 incomes were inflated to 2009 dollars and and compared to the 2009 income limits by household size published by CA Dept. of Housing and Community Development.

Sources: Census Public-Use Microdata Sample (PUMS), 2000; CA Dept. of Housing and Community Development, 2009; BAE, 2010.

[26] The 2007 Economic Census shows that in Berkeley 640 "Accommodation" employees had an average per capita payroll of $21,456 while 5,026 Food Services employees had a per capita payroll of $16,405. 1,434 employees in Arts, Entertainment and Recreation had a somewhat higher per capita payroll of $27,410. However, this difference seems to be caused by the fact that much (most?) restaurant employment and some hotel/motel employment is part-time. In addition, Arts, Entertainment and Recreation probably includes a minority of well-paid employees. However, overall we expect the household income distribution to be similar, and that is all we are concerned with here.

[27] *Affordable Housing Fee Nexus Study*, submitted to the City of Berkeley, October 2010 by Bay Area Economics and included as Attachment 1 to the Housing Department's report to the City Council, January 25, 2011 and also February 16, 2011. The quoted statement is on p. 20 of the Study.

Documentation of Linkage Between Commercial and Industrial Development in Berkeley and Need for Affordable Child Care in Berkeley

Originally prepared by Bill Lambert and Dave Fogarty
December 1988 - Updated October 2012

City of Berkeley Office of Economic Development
10/1/2012

Documentation of Linkage Between Commercial and Industrial Development in Berkeley and Need for Affordable Child Care in Berkeley

Note on the October 2012 Revision

For information on the background and motivation for this revision of the original 1988 study, please see the "Note" at the beginning of the October 2012 revision of the housing nexus study, Documentation on Linkage Between Commercial and Industrial Development in Berkeley and Need for Low and Very-Low Income Housing in Berkeley. We have applied the same policy in revising the child care nexus study: conserve the same title, most of the same calculation steps, and much of the language of the original but update all data elements with new numbers. We did, however, review recent nexus studies performed in other jurisdictions and attempt to update the methodology of the Berkeley child care nexus study where appropriate.

Staff necessarily bases the study on Berkeley's actual child care mitigation program: the practices that Berkeley's Commission on Early Childhood Education uses to allocate funds collected as child care mitigation payments. These practices differ in several ways from what is done in some other California cities that have child care mitigation programs. First, Berkeley targets its funds to assist the child care needs of low-income employed residents by subsidizing slots in licensed child care facilities. The subsidies go to both child care centers and licensed home-based child care. Most other cities in California use child care mitigation payments to subsidize the construction of new child care centers only. The difference between Berkeley and other cities may be due in part to the fact that Berkeley has an overall adequate space capacity in child care facilities and even a surplus for some age ranges[1], so there would be no little or nexus logic for a program to subsidize additional construction here, while there is a documented shortage of subsidized slots for low-income residents. Finally, perhaps because its program is administered by the Commission on Early Childhood Education, Berkeley has targeted its funds on the age group 0-5 while the facilities subsidized in other communities are usually open to children up to age 12. However, as pointed out below, the logic for a workplace-based child care mitigation program is strongest for pre-school children because parents usually want the child care facilities for this age range to be close to their workplace.

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[1] Cf. "City of Berkeley Child Care Profile" in *Alameda County, Early Care and Education for All, Needs Assessment Report, June 2006.*

INTRODUCTION

According to data provided by Bananas, the local child care resource center, in 2011 there was an average 5% vacancy rate for all full-time child care centers in Berkeley, the same vacancy rate as 1988.[2] This suggests that 5% represents a normal turnover vacancy rate for the industry. A lower vacancy rate would imply unmet demand for child care space. Also according to Bananas, subsidized full-time child care centers in Berkeley have an average vacancy rate of 2%. As of July 1, 2011, the 829 subsidized, full-time, child care center slots in Berkeley had a waiting list of 154 children[3], indicating a demand that is 18% greater than supply even though the number of subsidized slots has increased by 80% from the 458 that existed at the time of the first edition of this study in 1988. Logically enough, the primary form of unmet demand for child care in Berkeley continues to be for subsidized child care affordable to lower-income households.

One component of this unmet demand comes from the children of new employees who work in Berkeley as a result of the construction of new commercial space in Berkeley. Expansion of workspace in Berkeley results in the creation of new jobs, some proportion of which will be occupied by employees who will want child care in Berkeley. Some of them will live outside Berkeley but want child care near their workplace; others will both live and work in Berkeley and want child care in reasonable proximity to both work and home. Some employees who need child care will have high enough household incomes that they can afford to pay for it in the private child care market. Employees with lower household incomes, however cannot afford market-rate child care and will need to place their children in child care with below-market rates that are subsidized from public and private sources.

Based on reasoning and quantitative relationships explained in the 1988 version of this study, in 1993 the City Council adopted Resolution No. 56,913-N.S. *Establishing a Requirement that Applicants for Large Scale Office, Retail, Industrial and/or Other Commercial Development Projects Located in All Non-Residential and R-4 Zones, Excepting Projects in the South Berkeley Title IX Area, Offset the Project's Impacts on Affordable Child Care.* The Resolution required new office and retail projects over 7,500 sf in floor area to pay a mitigation fee of $1.00 per square foot and new industrial projects to pay $.50 per square foot to "mitigate" their impact on the supply of affordable child care. Since 1993, the affordable child

[2] Email from Arlyce Currie, Executive-Director of Bananas, to Dave Fogarty, November 18, 2011.
[3] Ibid.

care mitigation program has collected $743,813 in fees from 13 commercial developments.[4]

The analysis that follows updates the "nexus" study that links new commercial development in Berkeley to the project–related demand for subsidized child care slots. It then translates this demand into offsetting "mitigation" payments that developers of each major type of workspace (retail, hotel, office, R&D, industrial and warehouse) should be charged to compensate for the increased demand for affordable child care caused by the addition of new employees. The analysis identifies fee levels to be charged on a square foot basis to developers of new commercial and industrial space that could, provide a subsidy sufficient to make child care slots affordable to low-income employees who need child care in Berkeley.

The previous version of this nexus study attempted to quantify the demand for child care services created by all employees with children 0-12, the full age-range when children may need some type of child care services. However, the Berkeley program that distributes child care subsidies, which is managed by the Commission on Early Childhood Education, has only attempted to meet the needs of pre-school children (i.e., those 0-5) by subsidizing slots in child care centers and family day care for children of low-income households.[5] A nexus study has to be based on the parameters of the subsidy program that the exaction is actually paying for and not a hypothetical program that the City of Berkeley is not even considering.

In any case, this nexus study concerns the relationship between addition of workspace and employment in Berkeley and the demand for child care in Berkeley. Studies have documented that a high proportion of working parents prefer that their pre-school children be in child care near their workplace even when many of these parents do not live in the city where that workplace is located.[6] When the children become of school age, parents are much more likely to want child care near school and home than the workplace. Given that a large majority of Berkeley workers now live outside Berkeley, it is much more difficult to establish a nexus relationship between the addition of new workspace in Berkeley and the demand for

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[4] *Status of Housing and Child Care Mitigation Fees* report to the Berkeley City Council, May 3, 2011, from Michael J. Caplan, Economic Development Manager. The total in the report is $722,000 but additional revenues have been collected since then.

[5] For a summary of the program see the report to the Berkeley City Council, May 15, 2012, from the Commission on Early Childhood Education, *Child Care Voucher Program using the Child Care Mitigation Operating Subsidy Fund.*

[6] Cf. the discussion in Keyser Marston Associates, Inc., *Child Care Linkage Program prepared for City of Santa Monica,* November 2005, pp.16-17.

child care services in Berkeley for school age children than it is for children under six.

The analysis proceeds in steps, with each containing a discussion of the basis for assumptions and documentation for the numbers used in calculations. As with other nexus studies, we assume a prototypical 100,000 sq. ft. building intended for different uses (retail, office, industrial, etc.) These steps are:

1. Determine average new employment in Berkeley from construction of different types of non-residential buildings (prototype of 100,000 sf).
2. Adjust for long-term industry changes and persistent high unemployment which reduces the net employment increase in Berkeley attributable to new development.
3. Calculate number of new employees who have children in the age range 0-5, the age for which parents often want workplace-based child care.
4. Calculate parental demand for child care (i.e. households where all parents are working.)
5. Calculate number of child care arrangements represented by parental demand (i.e., adjust for the fact that some parents have several children.)

At this point, the study separates demand into two components: employee parents who work and also live in Berkeley and employee parents who work here but live elsewhere in the region. The next three steps concern employees resident in Berkeley:

6. Calculate proportion of employees who will live in Berkeley and their demand for child care (i.e., those who already lived in Berkeley prior to employment and those who will move here as a result of employment.)
7. Calculate new demand created by those who move to Berkeley as a result of their employment there (i.e., eliminate existing Berkeley residents who already had child care arrangements before employment.)
8. Reduce for "free" child care provided by relatives or friends to estimate demand for fee-based child care.

The next step focuses on child care demand created in Berkeley by non-resident employees who want child care close to their workplace:

9. Calculate non-resident employees who will want child care in Berkeley and the number of child care slots they will need.

The remaining steps bring the two components of demand back together:

10. Calculate total new demand for child care slots in Berkeley.
11. Convert employee child care demand to employee household child care demand.
12. Calculate number of lower income employee households by type of commercial property/workplace that qualify for City of Berkeley Child Care Subsidy Program.
13. Calculate average cost of child care in Berkeley and then calculate dollar value of the subsidy required for low income households to meet this cost.
14. Calculate maximum child care fees that could be charged by type of building/workplace based on the subsidy cost from step 13 multiplied by the lower income employee household data from step 12.
15. Divide by 100,000 square feet to translate the fees to a square foot basis by type of building/workplace.

Steps

1. Determine average new employment in Berkeley from addition of different types of non-residential buildings (100,000 sf prototype)

The first step estimates the number of employees who will work in each building prototype at full occupancy. This involves dividing the size of the building (100,000 sf) by the average number of square feet per worker ("employment density") in each major type of workspace.

OED's 1988 employment densities are in column 2 below and the proposed revisions are in column 3. Proposed new categories are in bold.

Type of Building	1988 Employment Density *(per employee)*	Proposed 2011 Density *(per employee)*
Office	275 sq. ft.	250 sq. ft.
Retail	500 sq. ft.	500 sq. ft.
Restaurant[7]	170 sq. ft.	500 sq. ft.
Industrial/ Manufacturing	1000 sq. ft.	500 sq. ft.
Hotel/ Lodging	1000 sq. ft.	500 sq. ft.
Warehouse/ Storage	n/a	1000 sq. ft.
Research and Development	n/a	500 sq. ft.

The companion affordable housing mitigation program Nexus Study[8] contains an explanation of how staff revised the employment density estimates for Berkeley, building types. We consulted a variety of sources: recent nexus studies for other cities in California (e.g., San Diego, Walnut Creek); published discussions of employment density trends[9]; and government statistics.[10] In order to take into account specific occupancies in Berkeley, staff sampled a certain number of Berkeley buildings and employers. [11] The revision also takes into account recent

[7] The 1988 nexus analysis used "Restaurant" as a separate category for analysis but the fee Resolutions collapsed it into the Retail category. In reality, it is logical for consider "restaurant" space as simply a type of "retail" in commercial linkage fee nexus studies. Developers of new buildings plan to build new "retail" space but rarely plan for specifically restaurant space. The decision to equip generic retail space as a restaurant is left to the future tenant. Therefore, except in rare instances, the staff administering the mitigation fees have no way of knowing how much, if any, of the planned retail space will become restaurant space. None of the other nexus studies use "restaurant" as a separate category but generally include it in retail. Note, however, that we have increased the density of "Retail" in Berkeley in part to adjust for the fact that restaurants are a very common category of new Retail space in Berkeley.

[8] *Documentation of Linkage Between Commercial and Industrial Development in Berkeley and Need for Low and Very-Low Income Housing in Berkeley*, originally prepared by Bill Lambert and Dave Fogarty, City of Berkeley Office of Economic Development, December 1988, Updated, October, 2011.

[9] Bob Johnson, *Floorspace Per Employee: An Elusive Prey,* Bob Johnston, CalPECAS Peer Advisory Team Mtg., San Francisco, CA March 24, 2010. (available on Internet); "Office walls are closing in on corporate workers" by Roger Vincent, Los Angeles Times, December 15, 2010; "Office Personal Space Is Crowded Out" by Sarah Needleman, Wall Street Journal, December 7, 2009.

[10] U.S. Energy Information Administration, *2003 Commercial Buildings Energy Consumption Survey: Building Characteristics Tables Revised June 2006.* Table B1. Summary Table: Total and Means of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003. This only official survey shows higher "mean square feet per worker" than other sources. Unfortunately, the Energy Information Administration has discontinued this survey.

[11] Businesses are asked to give the number of employees, including owners active in the business, on the business license form that they return every year. Property records show the total area of buildings, allowing a calculation of employment density when we have been able to obtain a list of all

changes in land use policy that encourage creation of buildings for industrial Research and Development.

These density factors are averages and any individual development proposal may be divergent. The fee Resolution will make provision for special treatment when a developer can demonstrate that the employment impact of his building will differ from the average density for the building type.

Using the density factors listed above, at full occupancy the prototype 100,000 sf building would house:

Type of Building (100,000 sf prototype)	2011 Employment Density (per employee)	Employment at Full Occupancy (employees)
Office	250 sq. ft.	400
Retail	500 sq. ft.	200
Restaurant[12]	500 sq. ft.	200
Industrial/ Manufacturing	500 sq. ft.	200
Hotel/Lodging	500 sq. ft.	200
Warehouse/ Storage	1000 sq. ft.	100
Research and Development	500 sq. ft.	200

In this analysis we treat a project's net addition of new business space as an incremental contribution to the total space available for economic activity in Berkeley over an extended period of time. The addition of new space for commercial activity accommodates employment growth in Berkeley, but it should be understood that the "new" business and employment is not necessarily located in the new project buildings themselves. A firm or firms already in Berkeley may move into that space, leaving its former space to be occupied by a new firm. A chain of moves

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businesses in a building. In practice, these calculations have themselves had to be adjusted to account for part-time employees. (The question on the business license form does not distinguish between fulltime and part-time employees.)

[12] The 1988 nexus analysis used "Restaurant" as a separate category for analysis but the fee Resolutions collapses it into the Retail category. This is logical because developers of new buildings in Berkeley generally plan for new "Retail" space but rarely plan for specifically restaurant space. The decision to equip generic retail space as a restaurant is left to the future tenant. Therefore, except in rare instances, the staff administering the mitigation fees have no way of knowing how much, if any, of the planned retail space will become restaurant space. None of the other nexus studies use "restaurant" as a separate category but generally include it in retail. Note, however, that we have increased the density of "Retail" in Berkeley in part to adjust for the fact that restaurants are a very common category of new Retail space in Berkeley.

triggered by the new commercial space ends by allowing the same employment growth to occur as if a business new to Berkeley had moved into the new space. In addition, the new building can be expected to have various (and perhaps many) tenants during its lifetime, so it would be unreasonable to link the mitigation requirements too closely to the characteristics of the project's first tenant(s).

2. Adjust for long-term industry changes and prolonged high unemployment

The analysis in step 1 assumes that new workspace created in Berkeley will facilitate or even directly lead to the creation of new employment in Berkeley (though, as pointed out in the previous section, the actual "new" jobs may not necessarily be located in the newly-built workspace.) However, the question arises whether, under present and foreseeable economic conditions, this assumption about the direct relationship between construction of net new workspace and addition of net new jobs is still valid. Some part of the persistently high level of unemployment since 2008 is no doubt cyclical and will be reduced when the economy recovers, but another part is structural and due to the decline of entire industrial sectors. For many years this has been true of manufacturing in the Bay Area in general and Berkeley in particular.[13] However, the total number of jobs in Berkeley was 10% lower in 2010 than 2001 and particularly since 2008 losses have occurred in a range of sectors like Retail Trade, Information, Management of Companies and Enterprises, and Administration and Support.[14] The length of the economic recession and the fact that slow or even negative growth is projected to continue for at least several more years undermines the assumption that new jobs will necessarily be net new jobs to the Berkeley economy. On the contrary, construction of new space and the creation of new jobs at a given location may simply replace, or partially replace, workspace and jobs lost elsewhere in Berkeley.

What this means for this analysis is that a higher proportion of newly-hired workers can be expected to be workers displaced from other local jobs and not necessarily workers who will need to move to Berkeley or the East Bay. Given the existence of a large pool of qualified but unemployed workers who are already resident locally, it seems likely that a higher proportion of new jobs will be filled by workers who already live locally, which means that they will not have the same

[13] The Economic Census conducted by the Census Bureau every five years shows employment in manufacturing declining from 8,300 in 1977 to 4,733 in 2007.

[14] Figures from the Labor Market Information Division of the State Employment Development Department show that Berkeley had 59,389 jobs in March 2010 compared to 65,815 in March 2001 (i.e., a 10% loss.) Retail Trade jobs declined from 6,518 to 5,216; Information sector jobs declined from 1,992 to 1,545 and jobs in Administration and Support and Waste Management and Remediation from 1,910 to 1,120.

impact on the local child care market as they would have if market conditions where tighter.

We therefore recommend that the projections from Step 1 be adjusted downward by a factor of (20%) to account for the fact that a proportion of jobs created by newly-constructed space will simply be replacing jobs lost elsewhere in the local economy, which is another way of saying that a proportion of new jobs can be expected to be filled by workers who already live locally because they have been displaced by local job losses.

Type of Building *(100,000 sf prototype)*	**Employment at Full Occupancy** *(employees)*	**Net New Local Jobs After Adjustment for Industry Change** *(employees x 0.8)*
Office	400	320
Retail	200	160
Restaurant[15]	200	160
Industrial/ Manufacturing	200	160
Hotel/ Lodging	200	160
Warehouse/ Storage	100	80
Research and Development	200	160

3. Calculate number of employees with children age 0-5

The net number of employees for each workplace type is then multiplied by a factor to estimate the number of employees with children age 0-5. While there have been no recent employee or employer surveys, the American Community Survey 2006-2010 Estimates tell us how many parents of children under 6 belonged to the Alameda County and Berkeley-resident labor force.[16] Parents of children under 6 made up 14.5% of the County labor force but only 8.6% of the Berkeley-resident

[15] The 1988 nexus analysis used "Restaurant" as a separate category for analysis but the fee Resolutions collapses it into the Retail category. This is logical because developers of new buildings in Berkeley generally plan for new "Retail" space but rarely plan for specifically restaurant space. The decision to equip generic retail space as a restaurant is left to the future tenant. Therefore, except in rare instances, the staff administering the mitigation fees have no way of knowing how much, if any, of the planned retail space will become restaurant space. None of the other nexus studies use "restaurant" as a separate category but generally include it in retail. Note, however, that we have increased the density of "Retail" in Berkeley in part to adjust for the fact that restaurants are a very common category of new Retail space in Berkeley.

[16] Table DP03, *Selected Economic Characteristics*, Alameda County and Berkeley.

labor force. We are going to assume that the characteristics of people who *work* in Berkeley would be closer to the County as a whole than to Berkeley residents and conservatively estimate that 12% of employees who work in Berkeley have children under 6.

Type of Building *(100,000 sf prototype)*	**Net New Local Employees at Full Occupancy**	**Number of Employees with Children 0-5** *(employees x 0.12)*
Office	320	38.4
Retail	160	19.2
Restaurant	160	19.2
Industrial/ Manufacturing	160	19.2
Hotel/ Lodging	160	19.2
Warehouse/ Storage	80	9.6
Research and Development	160	19.2

4. Calculate parental demand for child care (employees in households where both parents work)

Demand for child care services is assumed to come from two categories of employees with children: those who are single parents and those who are in families where both parents are in the labor force. Again, the American Community Survey has recent data that shows the number of parents in the work force (i.e., what is used in the previous step) and the number who come from households where "all parents are in the labor force." For parents of children under 6 in Alameda County as a whole, the ratio between these two groups is 62% and for the Berkeley-resident labor force 61%. Therefore we have applied the factor of .62 to calculate the number of parents who can reasonably be assumed to need child care.

Type of Building (100,000 sf prototype)	Employees with Children 0-5	Employees Who Need Child Care *(employees x 0.62)*
Office	38.4	23.8
Retail	19.2	11.9
Restaurant[17]	19.2	11.9
Industrial/ Manufacturing	19.2	11.9
Hotel/ Lodging	19.2	11.9
Warehouse/ Storage	9.6	5.95
Research and Development	19.2	11.9

5. Calculate number of child care arrangements needed

Some of these employees have more than one child requiring child care arrangements. Based on "conservative rounding" from two studies in the 1980s, the 1988 version of this study estimated that the average number of child care arrangements per employee would be 1.25. Recent Census data does not appear to shed light on this issue. However, in 2009 Bayer surveyed its Berkeley workforce to determine the potential employee usage of a proposed on-site child care center. Question 2 on the survey asked "How many children would you enroll?" 126 employees answered 1 child, 24 answered 2 children, 4 answered 3 children and 2 answered 4 children. With 156 employees proposing to enroll 194 children in the child care center, the average number of children for participating employees was 1.24.[18] We therefore retain the 1.25 figure from the 1988 study.

Multiplying the result of Section 4 by 1.25 produces the project employees' demand for child care arrangements: i.e., either informal child care by relatives or friends or paid child care "slots".

[18] Survey results communicated thanks to Trina Ostrander of Bayer.

Type of Building (100,000 sf prototype)	Employees Who Need Child Care Ages 0-5	Estimated Number of Child Care Arrangements Ages 0-5 *(employees x 1.25)*
Office	23.8	29.75
Retail	11.9	14.9
Restaurant	11.9	14.9
Industrial/ Manufacturing	11.9	14.9
Hotel/ Lodging	11.9	14.9
Warehouse/ Storage	5.95	7.44
Research and Development	11.9	14.9

Only a proportion of project employees will want their child care arrangements to be located in Berkeley because some will live elsewhere and want child care near home. The next four steps in this analysis estimate the number of children newly seeking child care within Berkeley. These include the children of project employees who reside in Berkeley and seek child care in reasonable proximity to both home and work and children of non-resident employees who seek child care near work.

6. Calculate number of employees who will live in Berkeley and their demand for child care

The next step is to estimate the number of employees needing child care who can be expected to reside in Berkeley. Only a fraction of the new employees who will work in Berkeley as a result of the addition of new business space can be expected to also live here because Berkeley is part of a much larger labor market/commute area. The 1988 nexus study estimated that fraction to be 30%. However, the percent of Berkeley workers who live in Berkeley has declined further since then, probably because fewer employees can afford to live here when home prices and rents tend to be higher than in other parts of the commute area. A recent study using Census Bureau data showed that "the percentage of all Berkeley workers who live in the City of Berkeley has declined over time—from 21.2% in 2002 to 16.8% in 2009."[19] We therefore estimate that 17% of new jobs would go to people who either already live in Berkeley or who would move here as a result of being employed in the new

[19] These figures were extracted from the Longitudinal Employer-Household Dynamics (LEHD) data set of the U.S. Census Bureau by Department of City and Regional Planning students Sean Camion, Kerry Fleisher, Brad Johnson, Anna McCorvey, Salma Mousallem, and Alison Nemirow for a study undertaken for the City of Berkeley Commission on Labor, Bayer & the City of Berkeley, May 2, 2011.

economic activity accommodated by new business space. The calculation for the number of employees who will need child care from the previous step (Step 4, above) should be multiplied by 0.17 to obtain the number of these employees projected to reside in Berkeley along with the projected number of child care arrangements they will need.

Type of Building (100,000 sf prototype)	Employees Who Need Child Care	Number of employees who Live in Berkeley *(Employees x 0.17)*	Number of Child Care Arrangements *(# employees live in Berkeley x 1.25)*
Office	23.8	4.05	5.06
Retail	11.9	2.02	2.52
Restaurant	11.9	2.02	2.52
Industrial/ Manufacturing	11.9	2.02	2.52
Hotel/Lodging	11.9	2.02	2.52
Warehouse/ Storage	5.95	1.01	1.26
Research and Development	11.9	2.02	2.52

7. Calculate new demand for child care created by employees who move to Berkeley as a result of employment here

Employees who already live in Berkeley are likely to already have child care arrangements and will probably not need to change them if they obtain a new job in Berkeley. New employees who move here as a result of their employment, on the other hand, are very likely to create new demand in the child care market because they will look for child care here. The question, then, is: of the 17% of employees who will live in Berkeley, what proportion already lived here and what proportion will move here?

The 1988 version of this study estimated that the split would be 30% already resident and 70% who would move here. The fact that the proportion of Berkeley-resident employees declined from 41.1% in 1980 to 16.8% in 2009 reflects the fact that historically the housing vacancy rate in Berkeley tends to be lower, and units somewhat higher priced, than in other comparable areas within commuting distance.[20] In addition to being the "structural" reason why over time a lower and lower proportion of our workforce has resided in Berkeley,

[20] Housing developers estimate that, for units of comparable size and quality, the market rent tends to be between 25% higher near campus and 10-15% higher elsewhere in Berkeley than other areas in the East Bay.

it means that people newly hired into Berkeley-based jobs who **do** want or need to move closer to their worksite are less likely to find housing in Berkeley itself than in other nearby communities. On the other hand, under current and foreseeable conditions a persistently high level of unemployment means that, for any local job vacancy, there will be more qualified job applicants who are already local residents. We would therefore expect that a somewhat lower proportion of new employees who live in Berkeley would be people who moved here because of their new job than the 70% estimated in 1988. It seems reasonable to estimate that the split would now be more like 50% people who already lived here prior to obtaining a job and 50% people who would move here.

We therefore apply a .5 reduction factor to the results of Step 6, the number of Berkeley-resident employees who need child care with the number of child care arrangements that they need, to estimate the number of employees who will move to Berkeley as the result of a new job in Berkeley and the number of child care arrangements they will need:

Type of Building (100,000 sf prototype)	Number of Employees Expected to Live in Berkeley	Number of Employees Who Will Have Moved to Berkeley *(employees x 0.5)*	Number of Child Care Arrangements *(employees x 1.25)*
Office	4.05	2.02	2.53
Retail	2.02	1.01	1.26
Restaurant	2.02	1.01	1.26
Industrial/ Manufacturing	2.02	1.01	1.26
Hotel/ Lodging	2.02	1.01	1.26
Warehouse/ Storage	1.01	0.505	0.63
Research and Development	2.02	1.01	1.26

8. Reduction for "free" child care

The 1988 Study pointed out that some new Berkeley-resident employees seeking child care would use "free" child care services provided by relatives or friends rather than fee-based child care in centers or licensed family day care. While existing studies at that time concluded that the percentage of children in "free" child care was as high as 33%, the 1988 Nexus study concluded that most free care is "primarily out of necessity rather than a preference for the specific provider; that is, the household would prefer to pay for a responsible care provider if it was

affordable." The study concluded, however, that "free" care should not be discounted altogether but estimated at 10%.

The best evidence suggests that, on a national level, about 27% of preschool children with employed parents are cared for primarily by relatives.[21] However, in 2006 the Alameda County Early Care and Education Needs Assessment concluded that "...compared to parents throughout the country, Berkeley parents with children aged two to four years old are more likely to demand licensed family child care or center-based care."[22] Based on this, plus the above reasoning that parents prefer a professional care provider if it is affordable, we have decided to retain the 1988 study's estimate of 10% free care. The number of child care arrangements projected in Step 7 is multiplied by 0.9 to calculate the number of fee-based child care slots required to satisfy the demand of new Berkeley-resident employee parents.

Type of Building (100,000 sf prototype)	Number of Employee Parents, Ages 0-5, Who Move to Berkeley	Number of Child Care Arrangements	Number of Fee-Based Child Care Slots *(x 0.9)*
Office	2.02	2.53	2.28
Retail	1.01	1.26	1.13
Restaurant	1.01	1.26	1.13
Industrial/ Manufacturing	1.01	1.26	1.13
Hotel/ Lodging	1.01	1.26	1.13
Warehouse/ Storage	0.505	0.63	0.57
Research and Development	1.01	1.26	1.13

9. Calculate number of non-resident employees who will want child care in Berkeley and the number of slots they will need

Steps 6-8 were concerned with new employees in working households with children 0-5 who both work and live in Berkeley, and more particularly with the subset that would move here as a result of their new job. This subset creates new demand for fee-based child care services here no matter whether the provider is closer to the employee's home or work. The other component of new demand for child care in Berkeley comes from the 83% of new employee working parent households with

[21] Freya L. Sonenstein et.al, *Primary Child Care Arrangements of Employed Parents: Findings from the 1999 National Survey of America's Families.* The Urban Institute, 2002. p. 3.
[22] "City of Berkeley Child Care Profile" in Alameda County, Early Care and Education for All, Needs Assessment Report, June 2006.

children 0-5 who reside elsewhere in the Bay Area but want their child care at or near their Berkeley workplace.

Evidence for projecting the proportion of employees who want child care at or near work is not very abundant. A 2001 survey conducted by the UCLA Center for Healthier Children, Families and Communities, *Public Opinion on Child Care and Early Childhood Education,* found that 76% of parents said that "they would be either very likely or somewhat likely to use a child care service offered at their place of work, and 62% say they would use it on a regular basis." However, employer-subsidized child care at or near the place of work, which maximizes the convenience of drop-off and pick-up as well as provides the parent with some access to the child even during work hours, is unusual even if it is highly desired. A representative survey of 1,126 employers in 2012 showed that only 7% of them provided it, with most of these large employers (1,000 or more employees.)[23]Most parents have to settle for a child care center or licensed family day care that is convenient to their workplace but not at it. We have to assume that the proportion of parents who would take the trouble to move their child to a child care service in Berkeley that is simply convenient to their place of work would be lower, perhaps much lower, than the 62% who said they would regularly use a facility at their workplace. A reasonable estimate may be that 50% of the new employees who work in Berkeley but live elsewhere would choose a facility in Berkeley for their child or children 0-5 years of age.

The results of the table in Step 5, the total number of employees needing child care for children age 0-5 and the total number of child care arrangements ("slots") they need,, are multiplied by 0.83 to calculate the 83% of employees who live outside Berkeley and the total number of slots they need. These numbers are then multiplied by 0.5 to calculate the number of employees with children age 0-5 who need child care *in Berkeley* and the number of slots they need there. It seems reasonable to assume that all of the child care arrangements in Berkeley by employees who live outside Berkeley would be fee-based child care in centers or licensed day care. The same proportion of employees who live outside Berkeley as inside would, of course, be able to arrange informal "free" child care by relatives and friends. However, it seems much more likely that the networks of family and friends that they would rely on for free child care would be near their residence and not their workplace. We therefore assume that the 10% of "free" child care (see Step

[23] Families and Work Institute, *2012 National Study of Employers*, analysis by Kenneth Matos and Ellen Galinsky, p. 22. 18% of the large employers provided child care but only 5% of the small employers (50-99 employees.) Significantly there was no increase in this benefit from 2005-2012.

8) is accounted for in the 50% of child care arrangements that these employees make near where are near where they live, not their Berkeley workplace.

CALCULATION OF NUMBER OF EMPLOYEES WHO WORK IN BERKELEY BUT DO NOT LIVE HERE WHO NEED CHILD CARE IN BERKELEY			
Type of Building (100,000 sf prototype)	**Employees Who Need Child Care Ages 0-5 (from Step 5)**	**Those Employees Who Live Outside Berkeley** *(x 0.83)*	**Employees Who Need Child Care in Berkeley** *(x 0.5)*
Office	23.8	19.75	9.87
Retail	11.9	9.87	4.93
Restaurant	11.9	9.87	4.93
Industrial/ Manufacturing	11.9	9.87	4.93
Hotel/ Lodging	11.9	9.87	4.93
Warehouse/ Storage	5.95	4.94	2.47
Research and Development	11.9	9.87	4.93

CALCULATION OF NUMBER OF FEE-BASED CHILD CARE SLOTS NEEDED IN BERKELEY BY EMPLOYEES WHO WORK BUT DO NOT LIVE IN BERKELEY			
Type of Building (100,000 sf prototype)	**Total Slots Needed for Children 0-5 (from Step 5)**	**Needed by Employees Who Live Outside Berkeley** *(x 0.83)*	**Needed as Fee-Based Slots in Berkeley** *(x 0.5)*
Office	29.75	24.69	12.34
Retail	14.90	12.37	6.18
Restaurant	14.90	12.37	6.18
Industrial/ Manufacturing	14.90	12.37	6.18
Hotel/ Lodging	14.90	12.37	6.18
Warehouse/ Storage	7.44	6.17	3.09
Research and Development	14.90	12.37	6.18

10. Calculate total new demand for child care slots in Berkeley

The results of Step 8, Berkeley-resident demand, and Step 9, non-resident demand in Berkeley, must be added to produce the total demand for fee-based child care slots in Berkeley for ages 0-5 created by new employees in Berkeley by type of workplace. Note that the number of employees represents those who are projected to create **new** demand for fee-based child care services for ages 0-5 in Berkeley. It therefore excludes those who already lived in Berkeley before securing a job created or facilitated by new construction here and who likely had already made child care arrangements prior to obtaining that job.

Type of Building (100,000 sf prototype)	Employees Who Move to Berkeley and Who Need Fee-Based Child Care for Ages 0-5 (from Step 8)[24] x 0.9	Employees Who Live Outside Berkeley Who Need Fee-Based Child Care in Berkeley, Ages 0-5 (from Step 9)	Total of Employees Who Need Fee-Based Child Care in Berkeley, Ages 0-5
Office	1.82	9.87	11.7
Retail	0.91	4.93	5.8
Restaurant	0.91	4,93	5.8
Industrial/ Manufacturing	0.91	4.93	5.8
Hotel/ Lodging	0.91	4.93	5.8
Warehouse/ Storage	0.454	2.47	2.9
Research and Development	0.91	4.93	5.8

[24] Note that the number of employees who move to Berkeley (from column 2 of the table in Step 8) is adjusted by multiplying by 0.9. This compensates for the 10% of employees who can be presumed to obtain "free" child care from relatives and friends, as explained in step 8.

Type of Building (100,000 sf prototype)	Fee-Based Child Care Slots, Ages 0-5, Needed by Employees Who Move to Berkeley (from Step 8)	Fee-Based Child Care Slots, Ages 0-5, Needed in Berkeley by Employees Who Reside Outside Berkeley (from Step 9)	Total Number of Fee-Based Child Care Slots, Ages 0-5, Needed In Berkeley
Office	2.28	12.34	14.6
Retail	1.13	6.18	7.3
Restaurant	1.13	6.18	7.3
Industrial/ Manufacturing	1.13	6.18	7.3
Hotel/ Lodging	1.13	6.18	7.3
Warehouse/ Storage	0.57	3.09	3.7
Research and Development	1.13	6.18	7.3

11. Convert number of employees to number of employee households

The steps up until now have yielded estimates of the number of workers, by type of workplace, who will work in Berkeley as a result of new workspace constructed here and the number of paid child care slots they can be expected to need in Berkeley for children age 0-5. Some of these employees have high enough household incomes so that they can afford to pay for child care without assistance. Employees from lower-income households, however, require a subsidy in order to be able to afford child care. The purpose of the child care mitigation program administered by the City of Berkeley Early Childhood Education Commission is to assist these households to pay for child care in Berkeley. The next steps of the analysis require us to analyze the incomes of employee households by type of workplace in order to determine what proportion of new employees in each type can be expected to need child care assistance. This information will then be used to estimate subsidy costs for employees who can be expected to work in each type of workplace in order to determine mitigation payments that will be required of developers of these workspaces.

The unit that searches for both housing and child care is the household, not the individual employee, and the City attempts to subsidize the child care needs of low-income residents based on household income. Statistically, the number of new employees occupying jobs at, or facilitated by, the new workspace will correspond to

a somewhat lower number of new households. This is because many households now include more than one worker. The relevant number is the average number of workers per worker households. Worker households are those that include at least one working member and therefore excludes households made up solely of students, retired people, or the unemployed. According to the American Community Survey, the average worker household in Berkeley comprised 1.55 earners in 2010, an increase from 1.38 used in the 1988 study.[25] Dividing this factor (1.55) into the number of employees by each workplace type who will look for child care in Berkeley for children 0-5 yields the number of such households by each workplace type.

Type of Building (100,000 sf prototype)	Employees Who Need Fee-Based Child Care in Berkeley, Ages 0-5 (from Step 10)	Employee Households Who Need Fee-Based Child Care in Berkeley, Ages 0-5 (/1.55)
Office	11.7	7.5
Retail	5.8	3.7
Restaurant	5.8	3.7
Industrial/ Manufacturing	5.8	3.7
Hotel/ Lodging	5.8	3.7
Warehouse/ Storage	2.9	1.9
Research and Development	5.8	3.7

12. Calculate number of employee households by type of building/workplace that qualify for the City of Berkeley Child Care Subsidy Program

This step projects the number of households with incomes low enough that they require assistance in paying for child care and, in particular, that qualify for assistance under the City of Berkeley's child care subsidy program. For this it uses a table developed by consultant Bay Area Economics for the recent City of Berkeley *Affordable Housing Fee Nexus Study* that shows by NAICS industrial sectors the percent of Berkeley employee households who fall into HUD-established income categories. (See Table B:2: *Income Level by Industry, Persons in 2000 by 2009 Income Limits)* The table controls for household size, adjusts household incomes from the 2000 census to 2009 dollars, and compares these with the 2009

[25] Table B08202, Household Size by Number of Workers in Household.. The 1988 figure was derived from the 1980 Census.

HUD Household Income Limits for Alameda County. The pattern of household income distribution within broad NAICS industrial sectors is relatively stable over time and since the table is for Berkeley employee households, it provides a good way to determine by sector the percent of households with members working here who need child care assistance. This, in turn, provides a basis for recommending child care mitigation fees for the different types of commercial property that host the different industrial sectors. The fees charged different types of development need to be proportionate to the underlying employee subsidy need created by the addition of different types of commercial property in Berkeley.

The City of Berkeley child care mitigation program awards subsidies to households with "incomes equal to or less than the greater of 60% of the Oakland SMSA median income or 84% of the State median income."[26] Although the relationship between these two measures is not constant, it appears that most of the time the effect of the potential recipients' ability to qualify under either standard is to raise the practical eligibility level to a little over 60% of the Oakland SMSA median income. We believe that the percent of households below 65% of AMI can stand as an accurate measure of the percent of households that are eligible for the City of Berkeley child care subsidy program:

The percent of lower income employees can be taken directly from Table B:2 for Manufacturing/industrial (NAICS 31-33) and Warehouse/Storage (NAICS 42) because these workspace categories correspond to complete NAICS sectors. This cannot be done so easily, however, for Retail Trade/Restaurants, Hotel/lodging, Research and Development and Office where, for various reasons, the workspace categories do not completely match one or more NAICS sectors represented in the table. For the companion Nexus Study, *Documentation of Linkage Between Commercial and Industrial Development In Berkeley and Need for Low and Very-Low Income Housing in Berkeley,* we made adjustments that are explained in its Appendix A, pp. to establish conservative estimates for the percent of households in the lower income ranges for these workplace categories. The table below adapted from Table B:2 of the City of Berkeley *Affordable Housing Fee Nexus Study* provides the percent of Berkeley employee households at or below 65% of AMI at three different levels defined by HUD.

[26] Email from Tanya Moore to Dave Fogarty, June 20, 2012.

Percent of Households at Lower Income Levels by Type of Workplace						
Income Levels	Office	Retail/ Restaurant	Mfg./ Industrial	Hotel/ Lodging	Warehouse/ Storage	R & D
Extremely Low Income (under 30% AMI)	5.05%	11.7%	5.4%	13.8%	6.6%	4.9%
Very Low Income (30%-50% AMI)	5.3%	12.3%	7.3%	14.3%	9.1%	5.3%
Low Income (50%-65% AMI)	4.54%	8.3%	6.0%	9.2%	6.7%	**4.6%**

Applied to the number of employee households who need fee-based child care in Berkeley for Ages 0-5 below (from Step 11), the table above is used to project the number of households for each workplace type who are at income levels that require assistance to purchase child care.

Calculation of the Number of Employee Households in HUD-Defined Lower Income Categories

Employee Households with Incomes under 30% of Area Median Income Who Need Child Care Assistance for Ages 0-5						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodg.	Warehouse	R&D
% of HH	5.05%	11.7%	5.4%	13.8%	6.6%	4.9%
Calculation	.0505 X 7.5	.117 X 3.7	.054 X 3.7	.138 X 3.7	.066 X 1.9	.049 X 3.7
No. of HH	= 0.378	= 0.433	= 0.199	= 0.51	= 0.125	= 0.181

Employee Households with Incomes above 30% but below 50% of Area Median Income Who Need Child Care Assistance for Ages 0-5						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodg.	Warehouse	R&D
% of HH	5.3%	12.3%	7.3%	14.3%	9.1%	5.3%
Calculation	.053 X 7.5	.123 X 3.7	.073 X 3.7	.143 X 3.7	.091 X 1.9	.053 X 3.7
No. of HH	= 0.397	= 0.455	= 0.270	= 0.529	= 0.173	= 0.196

Employee Households with Incomes above 50% but below 65% of Area Median Income Who Need Child Care Assistance for Ages 0-5						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodg.	Warehouse	R&D
% of HH	4.54%	8.3%	6.0%	9.2%	6.7%	4.6%
Calculation	.045 X 7.5	.083 X 3.7	.06 X 3.7	.092 X 3.7	.067 X 1.9	.046 X 3.7
No. of HH	= 0.337	= 0.307	= 0.222	= 0.340	= 0.127	= 0.170

13. Calculate the subsidies required by households at three low-income levels to pay for child care

We must now calculate the amount of subsidy that is required to provide child care for employee households at or below 65% of AMI, the practical standard for eligibility for the City's child care subsidy program. It is assumed that child care operators will charge market rate fees. According to Bananas, the main child care referral agency in the East Bay, in 2011 Berkeley child care centers charged an average of $1,616 per month for full-time infant care and $1,343 for full-time pre-school age care.[27] We do not have comparable estimates for the cost of full-time licensed family child care in Berkeley. Statistics for California as a whole, however, say that in 2010 the cost of full-time care for an infant in licensed family care was 61% of what it would cost in a child care center or $986 per month.[28] For child care for a four year old, the ratio was 84%., making the monthly cost in family child care $1,128 ($1,343 X.84 = $1,128.) In order to create an average cost of full-time child care in Berkeley, we need to weight these costs by the actual number of slots of each type of care that are available in Berkeley:

Calculation of Average Cost of Full-Time Child Care in Berkeley for Children 0-5

	Cost/Month Infant 0-2	Supply (# of slots)[29]	Total Cost Infant Care	Cost/Month Pre-School 3-5	Supply (# of slots)	Total Cost Pre-School 3-5
Child Care Center	$1,616	262	$423.392	$1,343	2,277	$3,058,011
Family Child Care	$ 986	124	$122,264	$1,128	392	$ 442,176

Average Cost = Total Cost Infant Care ($423,392 + $122,264)+ Total Cost Pre-School ($3,058,011 + $442,176) divided by total number of slots (3,055) = $1,324.

If we assume that all of the slots are occupied at the respective monthly rates, the average monthly cost for child care in Berkeley is $1,324 or $15,888 per year.

We now need to compare this average cost of child care with what lower income employee households can afford to pay. There appear to be two ways to do this and we will use both of them and compare the results.

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[27] Email from Arlyce Currie, November 18, 2011.
[28] National Association of Child Care Resource and Referral Agencies, *Parents and the High Cost of Child Care: 2011 Report*. Appendix 1. 2010 Average Annual Cost of Full-Time Care by State.
[29] Alameda County, *Early Care and Education for All, Needs Assessment Report*, June 2006. City of Berkeley Child Care Profile, Licensed Child Care supply by Age 2006.

First, we can apply the informal HUD standard that parents should spend no more than 10% of their family income on child care[30] to determine the amount of subsidy required to allow lower income households to meet it.

In 2011, the median income for a three-person household in Alameda County was $83,050 with the three relevant lower income thresholds (65% of AMI, Very Low Income-50% of AMI, and Extremely Low Income-30% of AMI) represented in the table below:

Lower Income Standards	2011 Income Alameda Co. (3-person Household)	What HH Can Afford (10%)	Deficit to meet Average Pre-School Child Care Payment	Subsidy Required to Meet HUD 10% Standard
65% of AMI (City Child Care Subsidy Standard)	$53,982	$5,398	$10,490	$10,490/ Year
50% of AMI (Very Low Income)	$41,550	$4,155	$11,733	$11,733/Year
30% of AMI (Extremely Low Income)	$24,950	2,495	$13,393	$13,393/ Year

We can also use the official California Department of Education, Child Development Division, *Family Fee Schedule*, to calculate the amounts that the State pays to subsidize child care for families at low-income levels, primarily CalWorks participants. In the past, the State made households below 84% of the State median eligible for subsidy but because of budget cuts this was lowered to 75% and now 70% of the State median income. Since both income and living costs are higher in the Bay area, 70% of the State median is about 51% of the Oakland median income. Households with incomes above this amount are not eligible for the State child care subsidy so the *Family Fee Schedule* no longer allows a subsidy at the 65% of the Oakland AMI.

In 2011, for a 3-person household with an income of $42,216 i.e., 50.8% of the Alameda County median income in 2011 and the highest income level eligible here for the child care subsidy), the State would expect the household to pay $4,283.58 per year for full-time child care, or very slightly over 10% of its income. The State subsidy would pay the remainder of the child care cost, or $11,604. This is very close to the HUD-recommended 10% standard shown in the table above. However,

[30] National Association of Child Care Resources and Referral Agencies, *Parents and the High Cost of Child Care: 2011 Report.* p. 11

for a 3-person household with an income of $25,272 (i.e., 30.4% of the Alameda County median income in 2011), the State would expect the household to pay only $781 per year, or 3% of its household income. The State child care subsidy program is therefore progressive, with very-low income households paying a lower portion of their income than households with somewhat higher incomes.

National and State policies on child care costs in relation to family income provide a frameworks on which to base a City policy for child care subsidies:

- HUD has an informal standard that households should pay no more than 10% of their income for child care.
- Families at 70% of the State AMI, now the highest income level eligible for the State of California child care subsidy program, pay approximately 10% of their income and the subsidy program pays the rest. However, in the Bay Area incomes and the cost of living are higher than in the state as a whole and the State eligibility threshold of 70% of AMI translates into 50% of AMI here. Families with 65% of the Alameda County AMI are no longer eligible for child care subsidies.
- However, the State child care subsidy program is progressive and families at incomes lower than 70% of the State AMI or 50% of the Alameda County AMI pay less than 10% of their income; for example, families at 30% of AMI only pay about 3% of their income, with the subsidy covering most of the cost of child care.

Based on a conservative interpretation of these policies, we consider it reasonable that the City of Berkeley child care mitigation program be based on the principle that developers ought to subsidize the child care expenses over 12% of income for households at 65% of AMI; over 10% of income for households at 50% of AMI; and over 4% of income for households at 30% of AMI. Using the average annual cost of child care estimated above and HUD 2011 Income Limits for Alameda County, we calculate annual subsidy costs:

Lower Income Standards	2011 Income Alameda Co. (3-person Household)	What HH Can Afford (variable % at different income levels)	Deficit to meet Average Pre-School Child Care Payment	Subsidy Required to Pay Average Child Care Payment
65% of AMI (City Child Care Subsidy Standard)	$53,982	0.12X$53,892 = $6,467	$9,421	$9,421/Year
50% of AMI (Very Low Income)	$41,550	0.1X$41,550 = $4,155	$11,733	$11,733/Year
30% of AMI (Extremely Low Income)	$24,950	0.04X$24,950 = $998	$14,890	$14,890/Year

14. Calculate maximum child care subsidy fee that could be charged for addition of each type of building /workplace

In Step 12 we calculated by type of workplace the number of employee households at three lower-income levels that are eligible for the City of Berkeley child care subsidy program for children ages 0-5. In Step 13 we calculated the average cost of child care in Berkeley for children of that age range. Based on existing state and federal child care subsidy precedents, we also calculated the maximum amount of child care subsidy per child at three household income levels that would be needed to pay for the average cost of child care in Berkeley.

The information from Steps 12-13 allows us to determine, by type of commercial property or workplace, the cost of the subsidy required to pay for the additional child care slots needed to meet the demand for preschool child care created by the new lower-income workers employed as a result of new construction. The mitigation fee the city charges to developers of each type of workspace amounts to the subsidy required to pay for market-rate child care for lower income households(i.e., the results of Step 14), multiplied by the number of such low-income households attracted to work in Berkeley (i.e., the results of Step 12). As a last step, the annual subsidy cost is capitalized and converted to a maximum fee per square foot that can be charged to each type of commercial property.

Calculation of Annual Subsidy Required to Pay for Child Care Costs in Berkeley of Lower Income Households Employed in Berkeley as a Result of New Development						
	Office	Retail/Res.	Mfg./Ind.	Hotel/Lodging	Warehouse	R&D
No. of HH -30% of AMI (Step 12)	0.378	0.433	0.199	0.51	0.125	0.181
Cost of Subsidy (Step 14)	$14,890	$14,890	$14,890	$14,890	$14,890	$14,890
Cost per year	$5,628	$6,447	$2,963	$7,594	$1,861	$2,695
No. of HH 30%-50% AMI (Step 12)	0.397	0.455	0.270	0.529	0.173	0.196
Cost of Subsidy (Step 14)	$11,733	$11,733	$11,733	$11,733	$11,733	$11,733
Cost per year	$4,658	$5,339	$3,168	$6,207	$2,030	$2,300
No. of HH 50%-65% of AMI (Step 12)	0.337	0.307	0.222	0.340	0.127	0.170
Cost of Subsidy (Step 14)	$9,421	$9,421	$9,421	$9,421	$9,421	$9,421
Cost per year	$3,175	$2,892	$2,091	$3,303	$1,196	$1,602
TOTAL Cost Per Year	$13,461	$14,678	$8,222	$17,104	$5,087	$6,597

The annual subsidy values attributed to the various types of commercial property need to be converted into one-time capital sums so that they can be allocated on a square-foot basis as mitigation fees. Since the lifetime of a commercial building is at least twenty years, it seems reasonable to use that time horizon and a conservative discount rate of 6% to capitalize the annual subsidy values:

Convert Annual Subsidy to Capital Value						
	Office	Retail/Res	Mfg./Ind.	Hotel/Lodging	Warehouse	R&D
Annual Subsidy, Child Care	$13,461	$14,678	$8,222	$17,104	$5,087	$6,597
NPV (20 years, 6%)	$163,660	$178,457	$99,964	$207,952	$61,848	$80,207

15. Divide by 100,000 to translate the fees to a per-square-foot basis by type of workplace.

The analysis has used prototype 100,000 sf buildings but the final product needs to be recommended fees that can be administered for buildings of any size on a square-foot basis. We therefore convert the capital subsidies from Step 14 into per-square-foot child care mitigation fees by type of workspace by dividing the capital sums by 100,000. The following are the maximum fees per square foot that it would be reasonable to charge to developers of commercial buildings to mitigate the child care demand impact of their developments.

Maximum Child Care Mitigation Fees per Square Foot by Type of Development					
Office	**Retail/ Restaurant**	**Mfg./ Industrial**	**Hotel/ Lodging**	**Warehouse/ Storage**	**Research & Development**
$163,660	$178,457	$99,964	$207,952	$61,848	$80,207
$1.63 sf	$1.78 sf	$0.99 sf	$2.08 sf	$0.62 sf	$0.80 sf

Attachment 3

Documentation of Linkage Between Commercial and Industrial Development In Berkeley and Need for Low and Very-Low Income Housing in Berkeley

Prepared by

Bill Lambert and Dave Fogarty
City of Berkeley Office of Economic Development
December 1988

disc 3 - hsgnex

DOCUMENTATION OF LINKAGE BETWEEN COMMERCIAL AND INDUSTRIAL DEVELOPMENT IN BERKELEY AND NEED FOR LOW AND VERY LOW INCOME HOUSING IN BERKELEY

Introduction

Urban economic theory has always held that there was a clear relationship between the addition of new buildings where people are employed and the demand for housing. If the new buildings add workspace and increase net employment, they will attract new workers to the area who will, in turn, increase the demand for housing. The additional demand in the housing market may induce builders to construct some amount of new housing, but it will also make existing housing more expensive. The increased cost and diminished availability of housing will have its greatest effect on low and moderate income households, who can least afford it.

In 1981 San Francisco began its Office Housing-Production Program which required developers to "mitigate" the housing market impact of new downtown office buildings by building or paying for new housing units. Subsequently, these employment-housing "linkage" programs have been adopted by various other U.S. cities, including Boston, Santa Monica, Seattle, Miami, and Hartford. Such programs usually focus on the provision of affordable housing for low-and moderate income people-- housing at purchase prices and rents below those needed to cover the costs of new construction, and which developers will therefore not build without a subsidy. The logic of most jobs-housing linkage programs holds that expanding the housing supply in the lower price and rent ranges will do the most to mitigate the impact on the housing market from the influx of new workers, since they would otherwise compete with existing residents for the limited stock of affordable housing.

This document calculates the number of new low-and very-low income households that can be expected to work in Berkeley and look for housing here as a result of the development of various types of new commercial and industrial workspace, and it calculates the subsidy required to build additional units of housing affordable to households in these income ranges. This analysis provides a quantitative basis for calculating the mitigation fee which should be charged for each type of development.

The analysis proceeds in steps, with each containing a discussion of the basis for assumptions and documentation for numbers used in calculations. These steps are:

- o Determine the project's additional employment impacts,
- o Determine the project's reduced employment impacts,
- o Estimate total new employment in Berkeley attributable to this added workspace
- o Estimate number of new employees who will reside in Berkeley (i.e., who already live here or who will move here)
- o Estimate number of employees who will move to Berkeley

- o Estimate number of new households represented by this number of employees
- o Estimate employee occupational structure
- o Estimate earnings and determine how many households need housing assistance
- o Adjust to eliminate multiple-earner households
- o Calculate housing subsidy required to build housing affordable to low and very-low income households
- o Calculate housing mitigation payment

1: PROJECT'S ADDITIONAL EMPLOYMENT IMPACTS

The first step is to calculate any eligible newly constructed or substantially rehabilitated Gross Floor Area (G.F.A.) for business activity attributable to the project, and the additional employment in Berkeley which should be attributed to it. Added to this should be the employment resulting from any space converted from one end use to another which carries a different employment density according to the figures outlined below.

The standard way to estimate this is based on employment density factors (number of square feet per employee) for each project end-use.

The OED standards for employment densities by type of workplace are adapted from two sources: the standards used to project jobs in UDAG projects (1) and a recent study by Gruen Gruen + Associates which compiled and interpreted previous surveys.(2) We selected the following conservative figures from ranges presented in these two studies:

Office space:	275	sq. ft. per employee
Retail space (ex. restaurants):	500	" "
Restaurant space:	170	" "
Industrial/manufacturing space:	1000*	" "
Hotel/lodging space:	1000	" "

* - Altered from 500 Sq.ft. 4/91 based on local empirical evidence.

Project employment is determined by dividing the total Gross Floor Area for each project end use by the employment density factor for that end use:

No. of office workers	=	G.F.A. of office space (sq. ft.)/275
No. of retail workers	=	G.F.A. of retail space (sq. ft.)/500
No. of restaurant workers	=	G.F.A. of restaurant space (sq.ft.)/170
No. of industrial workers	=	G.F.A. of manufacturing space (sq. ft.)/1000
No. of hotel/lodging workers	=	G.F.A. of hotel/lodging space (sq.ft.)/1000

In this analysis we treat a project's net addition of new business space as **an incremental contribution to the total space available for economic activity in the City over an extended period.** The addition of new space for commercial activity accomodates employment growth in Berkeley, but it should be understood that the "new" business and employment is not necessarily located in the new project buildings themselves. A firm or firms already in Berkeley may move into that space, leaving its former space to be occupied by a new firm. A chain of moves triggered by the new commercial space ends by allowing the same employment growth to occur as if a business new to Berkeley had moved into the new space. In addition, the new building can be expected to have various (and perhaps many) tenants during its lifetime, so it would be unreasonable to link the mitigation requirements too closely to the characteristics of the project's first tenant(s).

2) PROJECT'S REDUCED EMPLOYMENT IMPACTS

Next, the G.F.A. and resulting employment impacts of any space formerly used for commercial activity that is demolished or vacated by the project should be deducted. Also deducted should be any space that is converted from one type of end use to another which carries a different employment density according to the figures outlined above. This will produce the net additional employment impact.

The structure to be demolished or converted should be ignored for this calculation if it has been vacant of commercial uses for more than a year prior to the issuance of the use permit for the new project. By the same logic, rehabilitating a space that has been vacant for more than a year and bringing it back onto the market is assumed to have impacts similar to new construction.

For substantial rehabilitation projects, if the space was not vacant during the previous year, the average number of employees at the site during the previous year shall be deducted.

3: **ESTIMATE OF EMPLOYEES WHO WILL RESIDE IN BERKELEY**

The next step is to estimate the number of employees who will reside in Berkeley as a function of the increase in the number of jobs. Only a fraction of the new employees who will work in Berkeley as a result of the addition of new business space can be expected to also live here. The 1980 Census showed that, for the public and private sectors taken together, 41.1% of the holders of Berkeley jobs lived within Berkeley. In 1985 the Polaris Research and Development Corporation, under contract to the City of Berkeley, surveyed applicants for 1985 City of Berkeley business licenses to gather information on the private sector workforce. Polaris found that only 25.9% of the employees of private sector firms are residents of Berkeley.(3)

Based on this information, OED estimates that 30% of new jobs accomodated by new business space would go to people who either already live in Berkeley or who would move there as a result of being employed in new economic activity accomodated by project business space. The projections for employment by end-use workplace type should therefore be multiplied by .3 to obtain the number of employees projected to reside in Berkeley:

Projected employees by end-use x .3 = employees resident in Berkeley

4: ESTIMATE OF EMPLOYEES WHO WILL MOVE TO BERKELEY

This 30% share of new jobs will be filled partly by people who already live in Berkeley and partly by people who would move here as a result of their employment. The primary interest of this analysis is in the size of the second category, since the impact on the housing market will come from additional households competing for housing units in Berkeley. In order to know how many new housing units need to be provided to mitigate the effect on the housing market from this added demand for housing, the number of these **additional workers in additional households** needs to be calculated.

The 1986 EIR for the Durkee Site estimated that 15% of the new jobs going to Berkeley residents project would go to persons presently unemployed, underemployed or newly-entering the labor force. Another 15% of jobs would go to Berkeley residents who shift from other jobs outside the City. That means 70% of the new jobholders would be potential new Berkeley residents who would move from other areas.(4) The result of the previous section is now multiplied by 0.7.

Employees who will reside in Berkeley x 0.7 = New resident employees (i.e. who will move to Berkeley as a result of employment)

5: ESTIMATE OF THE NUMBER OF HOUSEHOLDS

The next step is to estimate the number of new households represented by this number of new resident employees. The household is the unit which impacts the housing market, and housing assistance programs are based on household income and household size. The 1980 Census showed that in Berkeley there were 1.38 wage earners per non-elderly household. This factor allows us to calculate the number of households who will move to Berkeley because of the expansion of jobs due to added workspace:

Employees in New Households (Step 4)	divided by	Average Number of Workers per Household (1.38)	=	New Households

6: DERIVATION OF EMPLOYEE OCCUPATIONAL STRUCTURE

Next, the number of employee households that are lower income or very-low income must be determined. As a preliminary step to estimating household income, employee households need to be broken-out into occupational groupings for each land use. For this analysis we have used the occupation-by-industry tables for California resulting from 1983-1985 surveys performed by the State Employment Development Department (EDD).(5) This has been used to estimate the ocupational composition of the following land uses: manufacturing/industrial (SIC 20-39), retail trade (SIC 52-59) except restaurants, restaurants (SIC 58), and hotels (SIC 70).

The occupational estimates for the broad sectors-- manufacturing and retail trade without restaurants-- have been weighted so that they reflect 1986 Berkeley employment within the 2-digit SIC industries that comprise these sectors. The occupational estimates for "Eating and Drinking Places" and "Hotels, Rooming Houses, Camps, and Other Lodging Places" are taken directly from the source mentioned above.

Developing an occupational estimate for "Office" land use is somewhat more complex, since "Office" is not a category used in the Standard Industrial Classification. We have therefore used the Berkeley Business License Information Database to obtain the employment and SIC classification of firms in four major downtown Berkeley office buildings. This information has then been used to calculate the occupational composition of "Office" employment in Berkeley, using the EDD occupation by industry tables. The results are summarized in Table 1:

TABLE 1.
BERKELEY EMPLOYMENT OCCUPATIONAL DISTRIBUTION

	Office	Retail	Restaurants	Hotel	Industrial/ Manufacturing
Professional/ Technical/Managers	35%	13%	7%	9%	21%
Sales	13%	54%	6%	4%	6%
Clerical	34%	12%	2%	13%	16%
Service	7%	6%	83%	67%	1%
Production	11%	15%	2%	6%	55%
TOTAL	100%	100%	100%	100%	100%

The percentages within each end-use category are then multiplied by the household figures to give an occupational projection by end-use type:

New Households	x	Percentage of Households in each Occupational Category	=	New Households in each Occupational Category

7: ESTIMATE FOR THE NUMBER OF EMPLOYEES WHO NEED HOUSING ASSISTANCE

This step calculates the number of employees in each occupational category who are low-or very-low income in terms of their ability to afford housing.

Every year HUD establishes income thresholds which qualify households for its housing assistance programs. The definition of "lower income family" is based on 80 percent of the median income for the area, with adjustments for smaller and larger families, and the "very low-income family" income limits are based on 50 percent of the median, with adjustments for family size. We have chosen the 3-person family as our standard because Berkeley tends to have a large number of small households: in 1980 the average household in Berkeley had 2.11 persons, while the county average was 2.53.(6) In 1988 a 3-person household qualified as "lower income" in the Oakland Metropolitan Statistical Area if its income was $28,900 or less, and "very low-income" if its income was $19,550 or less.(7)

To estimate the number of households in each occupational category which meet these definitions of "lower income" and "very-low income", we have used wage survey data collected by the U.S. Bureau of Labor Statistics (8), the State of California Employment Development Department (9), and the Bay Area Salary Survey Committee.(10)

These sources do not provide the same level of coverage for all occupations. The Bureau of Labor Statistics' annual Area Wage Survey for the Oakland Metropolitan Statistical Area provides adequate information on the weekly earnings of clerical workers and professional and technical workers. It tells us how many workers in various job types had earnings that would qualify them as "lower income" or "very-low income" if they were the sole means of support for a 3-person family. The same level of detail is available only for certain crafts and maintenance occupations; it does not exist for most production, sales, and service occupations.

Analysis of the distribution of the earnings of Oakland MSA clerical and professional and technical workers showed that 51% of the former and 14% of the latter would qualify as "very-low income" if they were the sole support of a 3-person household. An additional 45% of clerical workers qualify as "lower income", along with 27% of professional and technical workers.

Using these percentages as benchmarks, we estimated the distribution of earnings within the production, sales and service occupations. As a basis for estimating the relative prevalence of job categories within these occupations we have used the EDD occupational matrix by industry mentioned above, and have attributed wages to job categories according to the sources listed in footnotes 9-11 above.

The results are shown in Table 2 for the percent of households earning less than the very-low income and lower income standards in each broad occupational category:

TABLE 2
PERCENT OF EMPLOYEE HOUSEHOLDS* NEEDING HOUSING ASSISTANCE

	Very-Low Income (below 50% of median)	Lower Income (50%-80% of median)	Total Low & Very-Low
Professional/Technical/ Managers	14%	27%	41%
Sales	55%	40%	95%
Clerical	51%	45%	96%
Service	50%	35%	85%
Production	40%	30%	70%

* For this Table, Employee Households refers to households as if the employee were the sole earner present. In Section 8 below, the impact of additional household earners will be included.

This table on the percent of households eligible for very-low and lower income housing assistance by occupational category can be used to estimate how many employee households qualify for such assistance. The results from step 6, new households by occupational category, are multiplied by the percent "Very-Low Income" and "Lower Income" in the table above.

New Households In Each Occupational Category for Project Land Use	x	% Very-Low Income for that Occupational Category	=	Number of Employees eligible for Very-Low Income Housing Assistance
New Households In Each Occupational Category for Project Land Use	x	% Lower Income for that Occupational Category	=	Number of Employees eligible for Lower Income Housing Assistance

8: ADJUSTMENT TO ELIMINATE MULTIPLE EARNER HOUSEHOLDS

The next step, and the final one in calculating the number of households needing mitigating subsidy, adjusts the calculation for the number of eligible households to eliminate most of those with two or more earners. As indicated in Step 7, above, we have based our household income calculations on a standard of one income per household because while official sources publish up-to-date local wage and salary statistics by occupation, they do not give information on the overall household income of these workers. The rising labor force participation of married women since the 1960s has meant that two-thirds of American families now have more than one earner. By 1986, only about a third of American families with wage and salary income depended on only one earner. These two earner households could mean that the household no longer qualifies as very-low or low income, and might be lifted above the respective income thresholds. We therefore need to take out most multi-earner households from our calculation of the number of households eligible for housing assistance.

RELATIONSHIP BETWEEN INCOME AND NUMBER OF EARNERS
FOR FAMILIES WITH EARNINGS IN 1986

	1 Earner	2 Or More Earners
All Families With 1 Or More Earners	33%	67%

(Source: U.S. Bureau of the Census, Money Income of Households, Families, and Persons in the United States: 1986; Current Population Reports, Series P-60, No. 159, Table 22)

Because of the high probability (67%) that any given household as previously calculated has an additional worker, and that this worker's income may elevate the household income beyond the low income threshold, we have made the judgement to reduce by 50% the number of eligible very-low income and low income households due to this two earner household condition.

Number of Households Eligible for Very-Low Income Housing Assistance (From Step 7)	x	50% Adjustment to Eliminate Multiple Earner Households	=	Adjusted Number of Eligible Very-Low Income Hshlds.

The result is the number of housing units within each affordability category (very low and low income) which should be produced by the developer to offset the housing demand impact if the in-lieu fee option is not selected.

9: ESTIMATE FOR HOUSING SUBSIDY

The final step is to estimate the dollar amount of the subsidy which would be required to build housing affordable to very-low and lower income households. This amount is the in-lieu fee to be paid if the on-site option is not selected. To do this we need to calculate the gap between what these households can afford to pay for housing and the amount that is required to build new housing units in Berkeley.

Since 1980, HUD has assumed that households can afford to spend 30% of their gross income for housing. Based on this assumption, 3-person households at 50% and 80% of the 1988 Alameda County median income can afford to spend these annual amounts for rent:

Very-Low Income (50% of median) = $19,550 x .3 = $5,865
Lower Income (80% of median) = $28,900 x .3 = $8,670

OED has used a gross rent multiplier of 7.5 to identify the housing unit value that those annual rents could support. This multiplier came from data on 1983 and 1984 sales of apartment buildings in San Francisco.(11) Statistics on East Bay apartment sales in 1987 confirm that this is a reasonable gross rent multiplier for the Berkeley-Oakland area as a whole.(12) At that rate, the rents affordable to very-low and lower income households could support these two housing unit values:

$5,865 x 7.5 = $43,987
$8,670 x 7.5 = $65,025

Land acquisition, predevelopment, and construction costs derived from the City of Berkeley's recent construction of 61 units of affordable family housing show that a two-bedroom unit of 850 square feet could be produced for about $89,250:

850 square feet x $65 = construction cost of $55,250

$55,250 divided by .75 = cost of construction + "soft costs"* = $73,667

$73,667 divided by .80 = construction, "soft costs" and land = $92,083

* "Soft costs" are costs of development other than land and direct construction costs: i.e., architectural and engineering fees, legal costs, and the cost of interest on the construction loan.

We can then calculate the subsidy which would be required to build this unit when the rents that very-low and lower income households can afford are not high enough to cover the costs of production. The subsidy is the "gap"between the cost of producing the new unit and the value of the unit which could, hypothetically, be supported at the two rent levels:

50% of median $92,083 - $43,987 = $48,096 (round to $48,000 for subsidy)

80% of median $92,083 - $65,025 = $27,058 (round to $27,000 for subsidy)

10: CALCULATION OF HOUSING MITIGATION PAYMENT

Multiply the adjusted numbers of very-low and lower income households (from step 8, above) by the appropriate subidy:

Adjusted number of very-low income employees x $48,000

+

Adjusted number of lower income employees x $27,000

Total Housing Mitigation Payment

REFERENCES

(1) Halcyon Ltd., UDAG Job Projection Rules-of-thumb (Hartford, Conn.: Halcyon Ltd., 1981).

(2) Gruen Gruen + Associates, Employment Densities by Type of Workplace (San Francisco: Gruen Gruen + Associates, July 1985), pp. 36-41.

(3) Polaris Research and Development, Final Report, Integrating Berkeley's Private Sector Worforce: Policy and Program Development Options (San Francisco: Polaris Research and Development, August 1985). For Berkeley jobs held by residents and non-residents in 1970 and 1980, see Table 11, Jobs in Berkeley 1970-1980, p 26; for private sector in 1985 see Table 12, Private Sector Employees by Place of Residence and Occupational Category, City of Berkeley, p. 27.

(4) Mundie & Associates, Draft Environmental Impact Report on the Aquatic Park Center Project (Durkee Site) (San Francisco: Mundie & Associates, June 1986), p. 68.

(5) California. Employment Development Department. Employment Data and Research Division. Occupational Employment in the State of California: All Industries Summarized by 2-Digit SIC, 1983-1985 (Sacramento : Employment Development Department, n.d.)

(6) Association of Bay Area Governments, Projections 87: Forecasts for the San Francisco Bay Area to the Year 2005 (Oakland: ABAG, July 1987), p. 84.

(7) U.S. Department of Housing and Urban Development, Office of the Assistant Secretary for Housing-Federal Housing Commissioner, Memorandum for: Regional Administrators...Subject: Approval of revised income limits for lower income and very low-income families under the Housing Act of 1937 (Washington, D.C. : HUD, January 15, 1988)

(8) U.S. Bureau of Labor Statistics, Area Wage Survey: Oakland, California, Metropolitan Area, February 1987 (Washington, D.C. : GPO, May 1987). Bulletin 3040-10.

(9) California. Employment Development Department. Employment Data and Research. Annual Planning Information, Alameda County, 1988-1989 (San Francisco: Employment Development Department, Employment Data and Research, May 1988)

(10) Bay Area Salary Survey Committee, Wage and Salary Survey in the Counties of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, March 1987 (San Francisco : BASSC, 1987)

(11) Linda L. Hausrath, "Economic Basis for Linking Jobs and Housing in San Francisco," APA Journal, Spring 1988, p. 214.

(12) Grubb and Ellis indicates that the gross rent multiplier for 1987 apartment sales in Berkeley ranged between 5.5 and 7.5. Grubb and Ellis, Alameda County Real Estate 1988 (San Francisco, Grubb and Ellis: 1988), p. 11

Attachment 4

Documentation of Linkage Between Commercial and Industrial Development In Berkeley and the Need for Affordable Child Care in Berkeley

Prepared by

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City of Berkeley Office of Economic Development
December 1988

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Documentation of Linkage Between Commercial and Industrial Development In Berkeley and the Need for Affordable Child Care in Berkeley

According to data provided by Bananas, the local child care resource center, in June of 1988, there was an overall 5% vacancy rate for all full-time child care centers in Berkeley. This might represent a normal turnover operating vacancy rate for the industry. Anual demand beyond this would create a need for more child care space in the city.

According to the same source, subsidized, full-time child care centers in Berkeley, have a vacancy rate of 0.056%, or effectively zero. For the 458 subsidized, full-time, child care center slots in Berkeley, there is a waiting list of 216 children, indicating a demand that is 47% greater than the supply.

These statistics indicate a shortage in the supply of subsidized and non-subsidized child care center slots in Berkeley. New commercial development in Berkeley means additional employees in the labor force. The children of these employees are one component of the unmet demand for child care services.

Additionally, the City of Berkeley as a matter of policy favors promotion of local hiring (as evidenced by its First Source Employment Program). Increased access to affordable child care in the city will act as an inducement to parents to seek employment within the city where they can utilize these child care services. The effects of these policies will also help to reduce traffic impacts, another environmental concern created by new development, within the city of Berkeley.

The analysis that follows provides the nexus which first links new commercial development in Berkeley to the project-related demand for child care slots. It then translates the demand into offsetting mitigations which are needed to provide the additional child care slots and to make them affordable to project employee households of limited incomes.

The statistics and formulas presented below should be reviewed every three years for accuracy with current market conditions including but not limited to supply, demand, industry employment, employee income, household characteristics, fees for services, and State subsidy levels.

In summary the nexus argument follows these steps:

- Determine the project's additional employment impacts,
- Determine the project's reduced employment impacts,
- Estimate the number of employees with eligible children,
- Estimate the demand for child care services,
- Project the number are child care slots needed.
- Estimate the number of project-related employees who would reside in Berkeley, and as a subset of this, those who would be new to Berkeley,
- Estimate the number of slots demanded from non-resident project employees,

- o Determine the total demand for child care slots,
- o Estimate the start up subsidy needed for child care centers,
- o Estimate the number of lower income employee households who need subsidized child care assistance,
- o Estimate the amount of the per child operating subsidy,
- o Calculate the combined up front and ongoing operating subsidy.

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1. PROJECT'S ADDITIONAL EMPLOYMENT IMPACTS

The first step is to calculate any eligible newly constructed or substantially rehabilitated Gross Floor Area (G.F.A.) for business activity attributable to the project, and the additional employment in Berkeley which should be attributed to it. Added to this should be the employment resulting from any space converted from one end use to another which carries a different employment density according the figures outlines below.

The standard way to estimate this is based on employment density factors (number of square feet per employee) for each project end-use.

The OED standards for employment densities by project end-use are adapted from two sources: a 1985 study by Gruen Gruen + Associates which compiled and interpreted previous surveys (1) and "UDAG Job Projection Rules-of-Thumb" developed by Halcyon Ltd. in 1981 (2). We selected the following conservative figures from ranges presented in these two studies:

Office space:	275	sq. ft.	per employee
Retail space (ex. restaurants):	500	"	"
Restaurant space:	170	"	"
Industrial/manufacturing space:	1000*	"	"
Hotel/lodging space:	1000	"	"

* - Altered from 500 Sq.ft. 4/91 based upon local empirical evidence.

Project employment is determined by dividing the total Gross Floor Area for each project end use by the employment density factor for that end use:

No. of office workers	=	G.F.A. of office space (sq. ft.)/275
No. of retail workers	=	G.F.A. of retail space (sq. ft.)/500
No. of restaurant workers	=	G.F.A. of restaurant space (sq.ft.)/170
No. of industrial workers	=	G.F.A. of manufacturing space (sq.ft.)/1000
No. of hotel/lodging workers	=	G.F.A. of hotel/lodging space (sq.ft.)/1000

Note In this analysis we treat a project's addition of new business space as an incremental contribution to the total space available for economic activity in the City over an extended period. The addition of new space for commercial activity accomodates employment growth in Berkeley, but it should be understood that the "new" business and employment is not necessarily located in the new project buildings themselves. A firm or firms already in Berkeley

may move into that space, leaving its former space to be occupied by a new firm, and adding to total employment by the same amount as if a new business occupied the new space. The new building can be expected to have various (and perhaps many) tenants during its lifetime, some new enterprises and some existing.

2) PROJECT'S REDUCED EMPLOYMENT IMPACTS

Next, the G.F.A. and resulting employment impacts of any space formerly used for commercial activity that is demolished or vacated by the project should be deducted. Also deducted should be any space that is converted from one type of end use to another which carries a different employment density according to the figures outlined above. This will produce the net additional employment impact.

The structure to be demolished or converted should be ignored for this calculation if it has been vacant of commercial uses for more than a year prior to the issuance of the use permit for the new project. Bringing a space back into the market after a vacancy of a year or more would bring impacts similar to new construction.

For substantial rehabilitation projects, if the space was not vacant during the previous year, the average number of employees at the site during the previous year shall be deducted.

3. ESTIMATE OF EMPLOYEES WITH ELIGIBLE CHILDREN

The number of employees is then multiplied by a factor to determine the number of employees with children age 12 yrs. and under. This age group is used frequently in the child care industry as the cutoff age beyond which childcare services are not typically demanded (Bananas of Oakland).

The multiplying factor for this calculations is 0.30. This figure is a conservative rounding of an actual figure of 1/3 found in the Report of the Oakland Community Childcare Impact Committee presented to the Oakland City Council in October of 1984 (3). This data was derived by actual surveys.

Multiply the totals found in Section 2 by 0.3 to obtain the number of employees with children of childcare-using age.

4. ESTIMATE OF PARENTAL DEMAND

Demand for child care services was assumed to come from two subdivisions within the above set of workers - a) workers who are single parents and, b) workers who are "dual income parents" where both parents work.

Single parents represent 21%. An average of three survey results was taken to determine this figure - the Oakland study previously mentioned (21%); Portland State University Study (4) of 5/83 (26%); and Greater Washington Research Center (5) study of 12/82 (16%). 1980 Census data also indicates that single Berkeley women with children 12 years or under represent 16.4% of the workforce.

Dual income parents represent 63%. An average of the same three survey results was used to determine this figure - the Oakland study (67%); the Portland State Study (55%); and the Washington study (66%).

These two figures - (single parent plus dual income) total 87% and are also substantiated by reports of the converse situation, which state that traditional families (of one parent working/one at home) make up only 12% of the work force (Washington study, Oakland Tribune 11/14/86).

The two components, single and dual income parents, are then added together and the result (84%) is multiplied by the number of employees with children under 12 yrs. of age as derived in #3 above to calculate the number of employees needing childcare services (due to parent employment).

5. ESTIMATE OF CHILD CARE ARRANGEMENTS

Some of these employees have more then one child requiring child care arrangements. The employee demand for childcare above must be multiplied by the average number of childcare arrangements per employee for children under 12 yrs. of age. This figure of 1.25 is derived from an average of results found in the Portland and Washington studies, 1.4 and 1.14, respectively. Conservative rounding was used. Multiplying the result of Section 4 by 1.25 produces the project employees' demand for child care arrangements: i.e.. child care slots.

The next four steps in this analysis together estimate the number of these children newly seeking childcare <u>within Berkeley.</u> These include the children of project employees who reside in Berkeley and seek childcare near home and children of non-resident employees who seek childcare near work.

6. ESTIMATE OF EMPLOYEES WHO WILL RESIDE IN BERKELEY

The next step is to estimate the number of employees who will reside in Berkeley as a function of the increase in the number of jobs. Only a fraction of the new employees who will work in Berkeley as a result of the addition of new business space can be expected to also live here. The 1980 Census showed that, for the public and private sectors taken together, 41.1% of the holders of Berkeley jobs lived within Berkeley (6). In 1985 the Polaris Research and Development Corporation, under contract to the City of Berkeley, surveyed applicants for 1985 City of Berkeley business licenses to gather information on the private sector workforce (7). Polaris found that only 25.9% of the employees of private sector firms are residents of Berkeley.

Based on this information, OED estimates that 30% of new jobs accomodated by new business space would go to people who either already live in Berkeley or who would move there as a result of being employed in project business space. The projections for child care arrangements in #5 above should therefore be multiplied by .3 to reflect the number of employees projected to reside in Berkeley and need child care arrangements:

Projected # of chilcare slots x .3 = slots for Berkeley residents needing care

7. ESTIMATE OF EMPLOYEES WHO WILL MOVE TO BERKELEY

a) This 30% share of new jobs will be filled partly by people who already live in Berkeley and partly by people who would move here as a result of their employment. The primary interest of this analysis is in the size of the second category, since the impact on the demand for childcare will come from additional households competing for childcare in Berkeley. In order to know how many new childcare slots need to be provided to mitigate the effect on childcare availability from this added demand, the **additional workers in additional households** need to be calculated.

The 1986 EIR for the Durkee Site estimates that 15% of the new jobs going to Berkeley residents at that project would be obtained by Berkeley residents who are presently unemployed, underemployed or newly-entering the labor force. Another 15% of jobs would go to Berkeley residents who shift from other jobs outside the City. That means 70% of the new jobholders would be potential new Berkeley residents who would move from other areas.(8) The result of the previous section is now multiplied by 0.7.

Childcare slots of Berkeley residents x 0.7 = Slots of new resident empl.
(i.e. who will move to Berkeley as a result of employment)

As Berkeley residents these people will use Berkeley childcare whether they obtain care near work or home. Therefore, no distinction is made here between work-based vs. home-based preference for child care sites as in 8b below.

b) For those new Berkeley resident-employees seeking child care, some of the slots are "fee-based" and some are free (relatives, friends, immediate family, or children left alone). The Portland study attempted to quantify this free care figure and indicates 33%. The study does not indicate if these free slots are out of parental choice (for free family member care) or out of necessity for want of affordable care.

In discussions with local childcare experts, most indicate that the free care component is primarily out of necessity rather than a preference for the specific provider, that is, the household would prefer to pay for a responsible care provider if it weas affordable. Rather than discount this free care entirely, a factor of 10% free care is used by OED. Therefore, a factor of 90% fee-care, or 0.9 is multiplied by the results of 7a above.

New resident employee slots x 0.9 = New resident employee fee slots.

8. ESTIMATE OF NON-RESIDENT EMPLOYEES

a) Not all of of the project's employees are residents of Berkeley. A factor of .7 is used to calculate non-resident Berkeley employees. This figure is the complement to the 30% resident employees sited above in Section 6.

Multiply the result of Section 5 above, the project employees' child care slots, by 0.7, to obtain the number of children of non-resident employees needing care.

b) Commuters coming to Berkeley may or may not prefer a work-based childcare site. Data are available in several existing studies for actual site locations, but only the Oakland study provide site preference data. The Portland study showed work site locations to be 18% of child care slots; the Oakland preference data indicated a 40% preference for work-site locations by parents of infants and pre-schoolers (which are half of the age groups affected). A conservative figure of 20% work-site locations is used.

The work site preference of 20% is multiplied by the number of non-resident employee slots in 8a above to obtain the number of children of non-resident employees needing care within Berkeley.

All commuter slots are assumed to be fee based care.

9. ESTIMATE OF TOTAL DEMAND FOR CHILD CARE SLOTS

The results of sections 7 and 8 must be added to produce the total demand for Berkeley-based childcare slots created by non-resident project employees seeking childcare near work and new Berkeley resident project employees seeking childcare near work or home.

10. MITIGATIONS

Once the project generated demand for childcare has been determined, offsetting mitigations must be structured. To appropriately offset the child care impacts, two mitigation components are needed. The first addresses the need for provision of additional licensed space in which the child care operations are located. The second subsidizes the low income project-employee households so that they can afford to use these services.

11. PROVISION OF SPACE

With regard to the provision of adequate and licensed space, the developer can either provide space to a child care operator on-site, or pay a fee to allow the production of space off site. In the on-site provision, the developer shall be responsible for the up-front provision of the tenant improvements and equipment necessary to license and open a facility serving the number of children calculated in step 9.

To calculate the off-site fee, figures are taken from p.52 of the Oakland study pertaining to start-up expenses for either a typical rented or purchased childcare facility. OED approximated a mix of rented and purchased space, and further conservatively modified the costs downward to reflect more optimistic market conditions. The resulting start-up subsidy was then inflated from 1984 to 1988 dollars using the California CPI indicator (9). The result is $2,000 per child (see attached). To obtain the start up subsidy required for off site facilities, the number of slots determined from step 9 is then multiplied by $2,000.

Total No. of Child Care Arrangements * Start-Up Subsidy
Results of Section 9 * $2,000

Table 2. ESTIMATED CHILD CARE CENTER START-UP COSTS

(Preschool Center, 30 Children)

Start-Up Item	Rental	Purchase
Deposit	$3000	
Mortgage downpayment ($150,000 property, 20% down)		$30000
Renovations	20000	~~50000~~ 30000
Equipment* (play, office, educational)	15000	15000
Professional fees*	1000	1000
Permits	200	200
Administrative/planning* (@$10/hr, 10hrs/wk)	2400	2400
3 months' operating expenses (assuming 1/3 enrollment)	~~18000~~ 9000	~~18000~~ 9000
TOTAL START-UP COSTS	$ ~~59600~~ 50600	$ ~~116600~~ 87600

*Costs often covered in part through in-kind donations.

Change in Operating Subsidy... 1/3 enrollment for 1 month
2/3 enrollment for 1 month
full enrollment after 2nd month $9000

Rental Facility Only: $50,600/30 children = $1,687/child * CPI of 1.124 = $1,896 in 1988 $$

Average of Rental and Purchase: ($50,600+$87,600)/2 = $69,100/30 children = $2,303 /child
* CPI of 1.124 = $2,589 in 1988 $$

Final, conservative cost per child = $2,000

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS

DIVISION OF LABOR STATISTICS AND RESEARCH
P.O. Box 603, San Francisco, California 94101

CONSUMER PRICE INDEX-CALIFORNIA

Los Angeles-Anaheim-Riverside, San Francisco-Oakland-San Jose, San Diego United States City Average, 1987-88

All Items (1982-84 = 100)

Year and month	All Urban Consumer					Urban Wage and Clerical Workers				
	California[ab]	Los Angeles-Anaheim[c] Riverside	San Francisco Oakland[c] San Jose	San Diego	U.S. City Average	California[ab]	Los Angeles-Anaheim[c] Riverside	San Fransisco Oakland[c] San Jose	San Diego	U.S. City Average
1987										
January	113.4	113.4	112.5		111.2	110.8	110.8	111.3		110.0
February	114.6	114.7	113.4		111.6	112.0	112.1	112.4		110.5
March	115.2	115.5	113.7		112 1	112.6	112.8	112.8		111.0
April	115.9	116.0	114.8		112.7	113.3	113.3	113.9		111.6
May	116.5	116.8	115.0		113.1	113.9	114.1	113.9		111.9
June	116.3	116.5	115.0		113.5	113.7	113.8	114.0		112.4
July	116.6	116.5	115.8		113.8	113.9	113.8	114.7		112.7
August	117.2	117.3	116.1		114.4	114.5	114.6	114.9		113.3
September	117.8	118.0	116.6		115.0	115.1	115.2	115.4		113.8
October	118.4	118.6	117.1		115.3	115.7	115.8	116.0		114.1
November	118.2	118.2	117.3		115.4	115.5	115.4	116.2		114.3
December	118.4	118.5	117.4		115.4	115.7	115.7	116.4		114.2
Annual Average	116.6	116.7	115.4	117.5	113.6	113.9	114.0	114.3	111.1	112.5
1988										
January	119.0	118.9	118.4		115.7	116.2	115.9	117.5		114.5
February	119.4	119.7	117.9		116.0	116.5	116.6	117.0		114.7
March	120.4	120.6	119.1		116.5	117.4	117.5	117.9		115.1
April	120.6	121.1	118.7		117.1	117.8	118.0	117.8		115.7
May	121.6	122.0	119.7		117.5	118.7	118.9	118.7		116.2
June										
July										
August										
September										
October										
November										
December										
Annual Average										

19.7/65mos x 12 ⇒ use 3.6%/yr.

[a]Weight average of the consumer price indexes for the Los Angeles-Anaheim-Riverside and San Francisco-Oakland-San Jose. A conversion factor has been included for comparability of 1987 data with 1986 and prior years. Computed by the Department of Industrial Relations, Division of Labor Statistics and Research from indexes issued by the U.S. Department of Labor.

[b]These new indexes (new series) issued on February 27, 1987 and March 27, 1987 have been revised as shown above to provide a link to statistics in earlier years. This is the official series.

[c]1980 Census of Population metropolitan area definition.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

June 21, 1988

12. OPERATING SUBSIDY

Once the space is provided as in section 11 and run by an operator charging market rate fees, the problem still exists that some of the parents employed at the project will be low income employees who may not be able to afford the market rate fees for child care. A subsidy must be provided for these low income employee-households, who, according to the previous calculations, need childcare services.

a) ESTIMATE OF LOW INCOME HOUSEHOLDS

First the percentage of eligible low income households must be determined. (Although an employee may be low income, their household may not if it has multiple earners. Only needy low income households should be determined). The number of newly demanded child care arrangements calculated in sections 1-9 above, in each of the end use categories (office, retail, etc.) must be multiplied by the percentage of low income employee households in each of the end use categories.

Low income is defined as 80% or less of the Oakland Metropolitan Statistical Area (MSA) median income as published by HUD. As a preliminary step to estimating household income, employee households need to be broken-out into occupational groupings for each land use. For this analysis we have used the standard source, Occupational Employment in the State of California, All Industries, 1983-1985, (10). This has been used to estimate the ocupational composition of the following land uses: manufacturing/industrial (SIC 20-39), retail trade (SIC 52-59) except restaurants, restaurants (SIC 58), and hotels (SIC 70).

The occupational estimates for the broad sectors-- manufacturing and retail trade without restaurants-- have been weighted so that they reflect 1986 Berkeley employment within the 2-digit SIC industries that comprise these sectors. The occupational estimates for "Eating and Drinking Places" and "Hotels, Rooming Houses, Camps, and Other Lodging Places" are taken directly from the source mentioned above. Developing an occupational estimate for "Office" land use is somewhat more complex, since "Office" is not a category used in the Standard Industrial Classification. We have therefore used the Berkeley Business License Information Database (11) to obtain the employment and SIC classification of firms in four major downtown Berkeley office buildings (12). This information has then been used to calculte the occupational composition of "Office" employment in Berkeley, using the EDD occupation by industry tables. The results are summarized in Table 1 below.

Table 1

BERKELEY EMPLOYMENT OCCUPATIONAL DISTRIBUTION

	Office	Retail	Restaurants	Hotel	Industrial/ Manufacturing
Professional/ Technical/Managers	35%	13%	7%	9%	21%
Sales	13%	54%	6%	4%	6%
Clerical	34%	12%	2%	13%	16%
Service	7%	6%	83%	67%	1%
Production	11%	15%	2%	6%	55%
TOTAL	100%	100%	100%	100%	100%

The percentages within each end-use category are then multiplied by the number of child care slots calculated in steps 1-9 above.

New Slots x Percentage of Households in each Occupational Category = New Slots in each Occupational Category

b) ESTIMATE OF THE NUMBER OF HOUSEHOLDS WHO NEED ASSISTANCE
This step calculates the number of employees in each occupational category who are low or very low income. We use federal standards that define households who would qualify as low income if their income were the sole support of a three-person household.*

Every year the Dept. of Housing and Urban Development (HUD) establishes income thresholds which qualify households for its housing assistance programs. We use this federal standard. The definition of "lower income family" is based on 80 percent of the median income for the area, with adjustments for smaller and larger families, and the "very low-income family" income limits are based on 50 percent of the median, with adjustments for family size. In 1988 a 3-person household qualified as "lower income" in the Oakland Metropolitan Statistical Area if its income was $28,900 or less, and "very low-income" if its income was $19,550 or less (13).

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* We have selected this size household as our standard because Berkeley tends to have a large number of small households: in 1980 the average household in Berkeley had 2.11 persons, while the County average was 2.53. By 2005 the average Berkeley household is projected to decline to 1.95 persons, as against a County average of 2.43. (14)

To estimate the number of households in each occupational category which meet these definitions of "lower income" and "very-low income", we have used wage survey data collected by the U.S. Department of Labor (15), the State of California Employment Development Department (16)(17), and the Bay Area Salary Survey Committee (18).

These sources do not provide the same level of coverage for all occupations. The annual Area Wage Survey for the Oakland Metropolitan Statistaical Area (MSA) provides complete information on the weekly earnings of clerical workers and professional and technical workers. It tells us how many workers in various job types had earnings that would qualify them as "lower income" or "very-low income" if they were the sole means of support for a 3-person family. The same level of detail is available only for certain crafts and maintenance occupations; it does not exist for most production, sales, and service occupations.

Analysis of the distribution of the earnings of Oakland MSA clerical and professional and technical workers showed that 51% of the former and 14% of the latter would qualify as "very-low income" if they were the sole support of a 3-person household. An additional 45% of clerical workers qualify as "lower income", along with 27% of professional and technical workers.

Using these percentages as benchmarks, we estimated the distribution of earnings within the production, sales and service occupations. As a basis for estimating the relative prevalence of job categories within these occupations we used the EDD occupational matrix by industry mentioned above. For the wages to attribute to these job categories we have used information from multiple sources, particularly the EDD's Annual Planning Information: Alameda County and California Labor Market Bulletin, the Bay Area Salary Survey, as well as the Labor Department's Area Wage Survey, Oakland Metropolitan Area.

The results are shown in Table 2 for the percent of households earning less than the very-low income standard and the lower income standard in each broad occupational category:

Table 2

PERCENT OF EMPLOYEE HOUSEHOLDS* NEEDING ASSISTANCE

	Very-Low Income (below 50% of median)	Lower Income (50%-80% of median)	Total Low & Very-Low Inc
Professional/Technical/ Managers	14%	27%	41%
Sales	55%	40%	95%
Clerical	51%	45%	96%
Service	50%	35%	85%
Production	40%	30%	70%

* For this Table, Employee Households refers to households as if the employee were the sole earner present. In Section C below, the impact of additional household earners will be included.

This table on the percent of very-low and lower income households can be used to estimate how many employee-households will qualify for affordable child care assistance. The results from step 10.b)i), new arrangements by occupational category, are now multiplied by the percent "Total Low and Very-Low Income" in the table above.

New Slots In Each Occupational Category for Project Land Use	x	% Total Low & Very Low Income for that Occup. Category	=	No.of Lower Income Employee Slots Needing Assistance

c) ADJUSTMENT TO ELIMINATE MULTIPLE EARNER HOUSEHOLDS

The next step, and the final one in calculating the number of households needing mitigating subsidy, adjusts the calculation for the number of eligible households to eliminate most of those with two or more earners. As indicated in Step b), above, we have based our household income calculations on a standard of one income per household because while official sources publish up-to-date local wage and salary statistics by occupation, they do not give information on the overall household income of these workers. The rising labor force participation of married women since the 1960s has meant that two-thirds of American families now have more than one earner. By 1986, only about a third of American families with wage and salary income depended on only one earner. These two earner households could mean that the household no longer qualifies as very-low or low income, and might be lifted above the respective income thresholds. We therefore need to take out most multi-earner households from our calculation of the number of households eligible for assistance.

RELATIONSHIP BETWEEN INCOME AND NUMBER OF EARNERS
FOR FAMILIES WITH EARNINGS IN 1986

	1 Earner	2 Or More Earners
All Families With 1 Or More Earners	33%	67%

Source: U.S. Bureau of the Census (19)

Because of the high probability (67%) that any given household as previously calculated has an additional worker, and that this worker's income may elevate the household income beyond the low income threshold, we have made the judgement to reduce by 50% the number of eligible very-low income and low income households due to this two earner household condition.

Percent of Households Eligible for Low and Very-Low Income Assistance From Step 10.b)ii)	x	50% Adjustment to Eliminate Multiple Earner Households	=	Adjusted Percent of Low Income Households

d) ESTIMATE OF TOTAL NUMBER OF SUBSIDIZED CHILDCARE ARRANGEMENTS
The percent of eligible households is now multiplied by the number of child care arrangements determined in Sections 1-9 above. This assumes that the child care arrangements per employee household are evenly distributed over end uses and occupations. The result is the total number of subsidized child care arrangements to be provided if the in-lieu fee option is not selected.

e) ESTIMATE OF THE DOLLAR AMOUNT OF THE SUBSIDY PER CHILD
It is assumed that a childcare operator will charge market rate fees. These fees are periodically surveyed and reported by Childcare Resource and Referral Services throughout California. A California spring of 1986 survey (20) reported Berkeley market rate data for center based and family day care centers. Information from Bananas in September of 1987 further indicates that the distribution of licensed care provided in Berkeley was 60% center based and 40% family day care. Therefore, a weighted average calculation using 60% center based and 40% family care was taken over the three age groups and inflated with the California CPI to provide the following May of 1988 market rate averages.

Full-time Infant Care	$416/mo.
Full-time Pre-School Care	383/mo.
Part Time School Age Care (ages 6-12)	235/mo.

To compare these market rate fees with the fees employee households can afford, we used the California State Dept. of Education, Child Development Division "Family Fee Schedule" (21) which provides the amount that a family should (and must, under the State's programs) pay for child care services, given their household size and income level (See attached.) No family earning greater than 84% of the State median income level is eligible for State subsidy. In 1987 and '88, this maximum eligibility income was $21,768 or 60% of the Oakland area median income for a family of three.

California State Department of Education
Child Development Division
CD-2600 (Rev. 6-87)

FAMILY FEE SCHEDULE
For Fiscal Year 1987-88 Effective date: 7-1-87

Daily Fee		Number in Family										
1. Part Time	2. Full Time	1-3	4	5	6	7	8	9	10	11	12	3. Hourly Family Fee
		MONTHLY INCOME LEVEL										
0.50	0.90	1080	1285	1491	1697	1735	1773	1812	1850	1889	1927	0.10
0.60	1.08	1102	1311	1521	1731	1770	1808	1848	1887	1927	1966	0.12
0.70	1.26	1123	1336	1551	1765	1804	1844	1884	1924	1965	2004	0.14
0.80	1.44	1145	1362	1580	1799	1839	1879	1921	1961	2002	2043	0.16
0.90	1.62	1166	1388	1610	1833	1874	1915	1957	1998	2040	2081	0.18
1.00	1.80	1188	1414	1640	1867	1909	1950	1993	2035	2078	2120	0.20
1.10	1.98	1210	1439	1670	1901	1943	1986	2029	2072	2116	2158	0.22
1.20	2.16	1231	1465	1700	1935	1978	2021	2066	2109	2153	2197	0.24
1.30	2.34	1253	1491	1730	1969	2013	2057	2102	2146	2191	2235	0.26
1.40	2.52	1274	1516	1759	2002	2047	2092	2138	2183	2229	2274	0.28
1.50	2.70	1296	1542	1789	2036	2082	2128	2174	2220	2267	2312	0.30
1.65	2.97	1318	1568	1819	2070	2117	2163	2211	2257	2305	2351	0.33
1.80	3.24	1339	1593	1849	2104	2151	2199	2247	2294	2342	2389	0.36
1.95	3.51	1361	1619	1879	2138	2186	2234	2283	2331	2380	2428	0.39
2.10	3.78	1382	1645	1908	2172	2221	2269	2319	2368	2418	2467	0.42
2.25	4.05	1404	1671	1938	2206	2256	2305	2356	2405	2456	2505	0.45
2.40	4.32	1426	1696	1968	2240	2290	2340	2392	2442	2493	2544	0.48
2.55	4.59	1447	1722	1998	2274	2325	2376	2428	2479	2531	2582	0.51
2.70	4.86	1469	1748	2028	2308	2360	2411	2464	2516	2569	2621	0.54
2.85	5.13	1490	1773	2058	2342	2394	2447	2501	2553	2607	2659	0.57
3.00	5.40	1512	1799	2087	2376	2429	2482	2537	2590	2645	2698	0.60
3.15	5.67	1534	1825	2117	2410	2464	2518	2573	2627	2682	2736	0.63
3.30	5.94	1555	1850	2147	2444	2498	2553	2609	2664	2720	2775	0.66
3.45	6.21	1577	1876	2177	2478	2533	2589	2646	2701	2758	2813	0.69
3.60	6.48	1598	1902	2207	2512	2568	2624	2682	2738	2796	2852	0.72
3.75	6.75	1620	1928	2237	2546	2603	2660	2718	2775	2834	2891	0.75
3.90	7.02	1642	1953	2266	2579	2637	2695	2754	2812	2871	2929	0.78
4.05	7.29	1663	1979	2296	2613	2672	2730	2790	2849	2909	2968	0.81
4.20	7.56	1685	2005	2326	2647	2707	2766	2827	2886	2947	3006	0.84
4.35	7.83	1706	2030	2356	2681	2741	2801	2863	2923	2985	3045	0.87
4.50	8.10	1728	2056	2386	2715	2776	2837	2899	2960	3022	3083	0.90
4.70	8.46	1750	2082	2415	2749	2811	2872	2935	2997	3060	3122	0.94
4.90	8.82	1771	2107	2445	2783	2845	2908	2972	3034	3098	3160	0.98
5.10	9.18	1793	2133	2475	2817	2880	2943	3008	3071	3136	3199	1.02
5.30	9.54	1814	2159	2505	2851	2915	2979	3044	3108	3174	3237	1.06
5.50	9.90	1836	2185	2535	2885	2950	3014	3080	3145	3211	3276	1.10
5.75	10.35	1858	2210	2565	2919	2984	3050	3117	3182	3249	3314	1.15
6.00	10.80	1879	2236	2594	2953	3019	3085	3153	3219	3287	3353	1.20
6.25	11.25	1901	2262	2624	2987	3054	3120	3189	3256	3325	3392	1.25
6.50	11.70	1922	2287	2654	3021	3088	3156	3225	3293	3362	3430	1.30
6.75	12.15	1944	2313	2684	3055	3123	3191	3262	3330	3400	3469	1.35
7.00	12.60	1966	2339	2714	3089	3158	3227	3298	3367	3438	3507	1.40
7.25	13.05	1987	2364	2743	3122	3192	3262	3334	3404	3476	3546	1.45
7.50	13.50	2009	2390	2773	3156	3227	3298	3370	3441	3514	3584	1.50
7.75	13.95	2030	2416	2803	3190	3262	3333	3407	3478	3551	3623	1.55
8.00	14.40	2052	2442	2833	3224	3297	3369	3443	3515	3589	3661	1.60
8.25	14.85	2074	2467	2863	3258	3331	3404	3479	3552	3627	3700	1.65
8.50	15.30	2095	2493	2893	3292	3366	3440	3515	3589	3665	3738	1.70
8.75	15.75	2117	2519	2922	3326	3401	3475	3552	3626	3702	3777	1.75
9.00	16.20	2138	2544	2952	3360	3435	3511	3588	3663	3740	3815	1.80
9.25	16.65	2160	2570	2982	3394	3470	3546	3624	3700	3778	3854	1.85

60% of Oakland's median-3 person family = 84% of State median

21.7 days/mo.

Family Fee

FT	PT
$207/mo.	$115/mo.

1. Part-time: Enrollment for fewer than 6.5 hours per day.
2. Full-time: Enrollment for 6.5 hours or more per day.
3. Hourly family fee: Used by county welfare departments.

Eligibility for Child Day Care

A family whose gross monthly income at the time of application is more than 84 percent of the state median income is ineligible for subsidized child development services. The 84 percent level is underlined in the above chart. Any family receiving child development services whose gross monthly family income increases beyond the amount entered at the bottom of the column for the appropriate family size becomes ineligible for subsidized child development services.

Families having only one or two members are for purposes of determining eligibility and fees treated as three member families.

OED used this income level, at 60% of area median income, and a three person household size, as the basis to determine the fee a typical lower income household can afford. This is $207 per month for full-time care and $115 per month for part-time care according to the State published guidelines. The difference between the market rate fee and the State published family fees represents the subsidy level needed by low income households for each type of care.

To arrive at a single dollar value subsidy, a weighted average of the types of care and their corresponding subsidies is taken. Three categories must be weighted over the entire spectrum of care from 0-12 yrs. of age. Assuming a uniform age distribution of children, Infants, at 0-2 yrs. represent 17% of total care; Pre-schoolers at 3-5 yrs. represent 25% of total care; and School Agers at 6-12 yrs. represent 58% of total care.

The Infant Care and Pre-School care groups are normally classified as full-time care. But the studies show that few parents use formal child care arrangements 40 hours per week. The Greater Washington survey indicated an average of 30 hours per week usage across all age groups for home-based care, family care, and center-based care. Center based care, averaged 29 hours per week. The Oakland study reported just over half the parents used full-time child care and pre-school care. A conservative 70% utilization rate (28 hrs per week) is inserted into the formula. The School Age child care arrangements, ages 6-12 years, are assumed to be part-time before and after school care. Part-time market rate and State subsidy schedules are used for this component.

The fee formula now reads as follows with the Infant, Pre-School and School-Age components each weighted appropriately. 70% is the utilization rate for infants and pre-schoolers; and 17%, 25%, and 58% are the percentage shares of total childcare for infants, pre-schoolers and 6-12 year olds, respectively. The first number in each of the rounded parenthesis is the market rate fee and the second is the State family fee.

$$70\% \times [17\% \times (416-207) + 25\% \times (383-207)] + 58\% \times (235-115) \text{ per mo.} \times 12 \text{ mos.}$$

The resulting subsidy fee per low income employee household childcare slot is rounded to $1,500 per year. This represents an annual charge per child care slot and shall be applied to the number of slots found in step 12.d) above and paid for over a period of thirty years as adjusted for inflation.

13. OPERATING SUBSIDY COMPONENT

The second component of the mitigation fee, the operating subsidy for children of low income households, shall be calculated by multiplying the number of low income employee households needing child care (results of Section 12.d) by the Operating Subsidy (result of Section 12.e). This represents an annual fee to be paid over thirty years. The schedule of payments shall be adjusted for inflation each year by multiplying the first year subsidy amount by the result of the San Francisco-Oakland Consumer Price Index figure for that year divided by the CPI for 1988.

No. of Low Income Employee Household Arrangements * Operating Subsidy * Infl.
Results of Section 12.d) * $1,500 * (CPI in Yr./CPI in May, 1988 = 119.7)

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