LAND USE MODELING REPORT

Plan BayArea 2040

FINAL SUPPLEMENTAL REPORT

Metropolitan Transportation Commission

Association of Bay Area Governments

JULY 2017

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Plan Bay Area 2040:
Final Land Use Modeling Report

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Executive Summary

This report presents a technical overview of the Bay Area UrbanSim Land Use Model application, performed in support of the Association of Bay Area Government (ABAG) and the Metropolitan Transportation Commission's (MTC's) Plan Bay Area 2040 Draft Environmental Impact Report (DEIR). The document provides a brief overview of the technical methods used in the analysis, a description of the key assumptions made in the modeling process, and a presentation of relevant results for each EIR alternative.

Chapter 1: Analytical Tools

This section provides a high-level overview of the Bay Area UrbanSim Land Use Model application. The model provides a consistent, theoretically-grounded means of forecasting land use change in the Bay Area for the different combinations of control totals and planning policies that are incorporated into the EIR Alternatives. In addition, Bay Area UrbanSim is integrated with the MTC Travel Model to address the interactions between transport system changes and land use changes.[1] This section includes an overview of the model structure, simulation sub-models, a description of the interaction between UrbanSim and the Travel Model, and a brief introduction to the EIR Alternatives.

Bay Area UrbanSim Land Use Model Application

UrbanSim is a modeling system developed to support the need for analyzing the potential effects of land use policies and infrastructure investments on the development and character of cities and regions. UrbanSim has been applied in a variety of metropolitan areas in the United States and abroad, including Detroit, Eugene-Springfield, Honolulu, Houston, Paris, Phoenix, Salt Lake City, Seattle, and Zürich. The application of UrbanSim for the Bay Area was developed by the Urban Analytics Lab at UC Berkeley under contract to MTC.[2]

The area included in the Bay Area model application includes all incorporated and unincorporated areas of the nine-county Bay Area.[3] This geographic area defined the scope of the data collection efforts necessary to define the modeling assumptions. The year 2010 was selected as the base year for the parcel-based model system.

Within UrbanSim there are several sub-models simulating the real-world choices and actions of households and businesses within the region. Households have particular characteristics such as income that may influence preferences for housing of different types at different locations. Businesses also have preferences that vary by industry for building types and locations. Developers construct new buildings or redevelop existing ones in response to demand and planning constraints, such as zoning. Buildings are located on land parcels that have particular characteristics such as value, land use, topography, and other environmental qualities. Governments set policies that regulate the use of land, through the imposition of land use plans, urban growth boundaries, environmental regulations, or through pricing policies such as development impact fees. Governments also build infrastructure, including transportation infrastructure, which interacts with the spatial distribution of households and businesses to generate patterns of accessibility at different locations that in turn influence the attractiveness of these sites for different consumers.

The Bay Area UrbanSim model system simulates these choices through the sub-models described below and shown in Figures 1, 2, and 3. Figures 1, 2 and 3 also show how the Travel Model and Bay Area UrbanSim interact. Several of the system models include algorithms that aim to match the total number

[1] A discussion of the travel forecasting procedure is available in the *Travel Modeling Report*.

[2] More information on UrbanSim is available at http://urbansim.com

[3] Technical information on Bay Area UrbanSim can be found at https://github.com/MetropolitanTransportationCommission/bayarea_urbansim

of units (e.g. jobs, households) prepared by ABAG. These control totals are checked at the end of each model year run. In each of Bay Area UrbanSim's annual predictions, the model system steps through the following components:

1. The *Employment Transition Model* predicts new businesses being created within or moved to the region, and the loss of businesses in the region – either through closure or relocation out of the region. The role of this model is to keep the number of jobs in the simulation synchronized with aggregate expectations of employment in the region forecasted by ABAG.
2. The *Household Transition Model* predicts new households migrating into the region, the loss of households emigrating from the region, or new household formation within the region. The Household Transition Model accounts for changes in the distribution of households by type over time, using an algorithm analogous to that used in the Business Transition Model. In this manner, the Household Transition Model keeps Bay Area UrbanSim household counts synchronized with the aggregate household projection forecasted by ABAG.
3. The *Real Estate Development Model* simulates the location, type, and density of real estate development, conversion, and redevelopment events at the level of specific land parcels. This sub-model simulates the behavior of real estate developers responding to excess demand within land use policy constraints. The algorithm examines a subset of parcels each forecast year and builds pro formas comparing development costs and income. New structures are built in profitable locations.
4. The *Scheduled Development Events Model* provides an alternative means for the introduction of new buildings into the region. This component is simply a list of predetermined structures to be built in particular future years. These represent large, committed, public-private partnership projects and are shown in Table 1.
5. The *Employment Relocation Model* predicts the relocation of business establishments (i.e. specific branches of a firm) within the region each simulation year. The Business Relocation Model predicts the probability that jobs of each type will move from their current location to a different location within the region or stay in place during a particular year.
6. The *Household Relocation Model* predicts the relocation of households within the region each simulation year. For households, mobility probabilities are based on the synthetic population from the MTC Travel Model. Drawn from Census data, these rates reflects the tendency for younger and lower income households to move more often.
7. The *Government Growth Model* uses a set of rules to project the employment in non-market sectors such as government and schools based on historical employment in those sectors and projected local, sub-regional, and regional population growth.

TABLE 1: SELECT SCHEDULED DEVELOPMENT EVENTS

Scheduled Development Event
Alta Bates Oakland Expansion
Kaiser Oakland Expansion
MacArthur BART Transit Village Construction
South Hayward BART Transit Village Construction
Concord Community Reuse Construction
Lawrence Berkeley Lab 2 Construction
Pleasant Hill BART Transit Village Construction
Richmond BART Transit Village Construction
Walnut Creek Transit Village Construction
Hunters Point Naval Shipyard Construction
Mission Bay Construction
Moscone Center Expansion
Park Merced Redevelopment
San Francisco General Hospital Expansion
Transbay Terminal Redevelopment
Treasure Island Construction
Bay Meadows Construction
Kaiser Redwood City Expansion
Sequoia Hospital Expansion
Stanford Medical Center Expansion
Berryessa BART Transit Village Construction

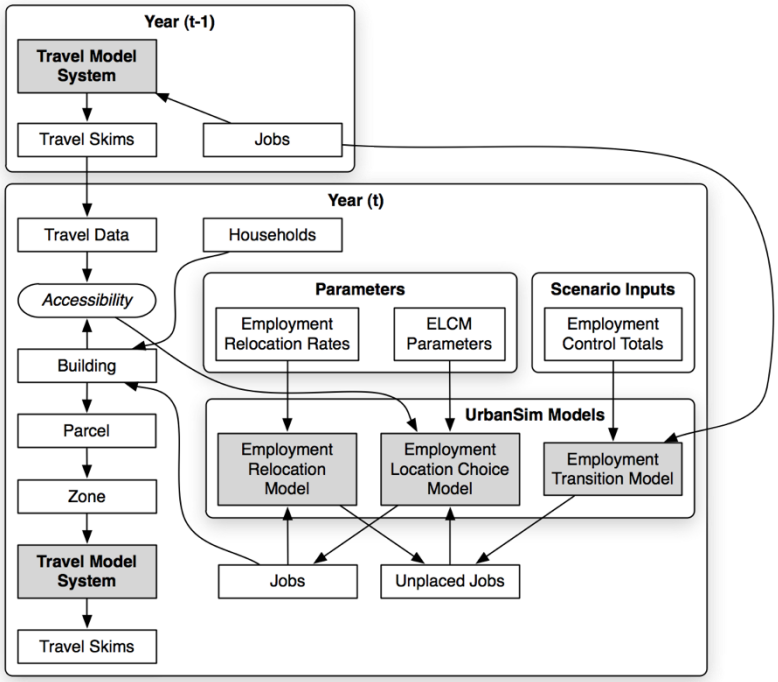


FIGURE 1: URBANSIM MODEL FLOW: EMPLOYMENT FOCUS

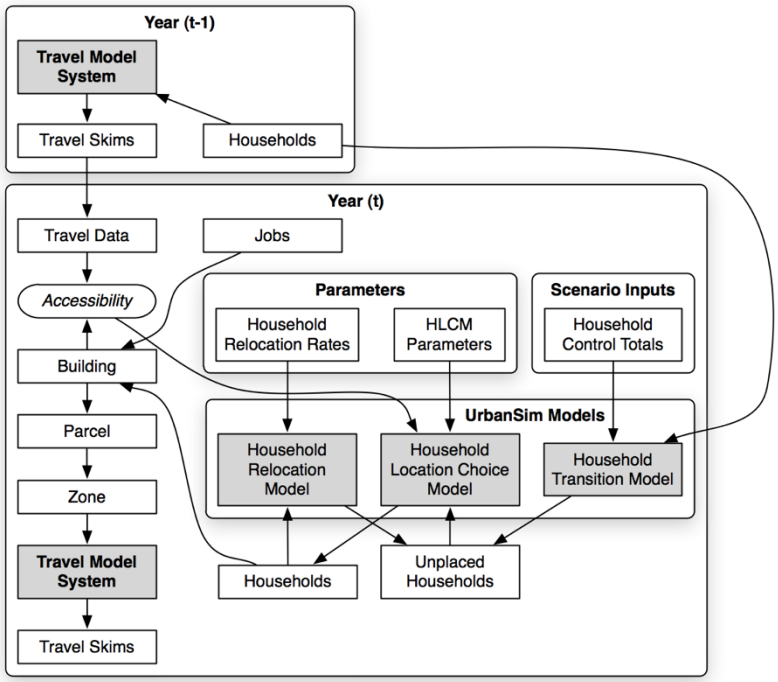


FIGURE 2: URBANSIM MODEL FLOW: HOUSEHOLD FOCUS

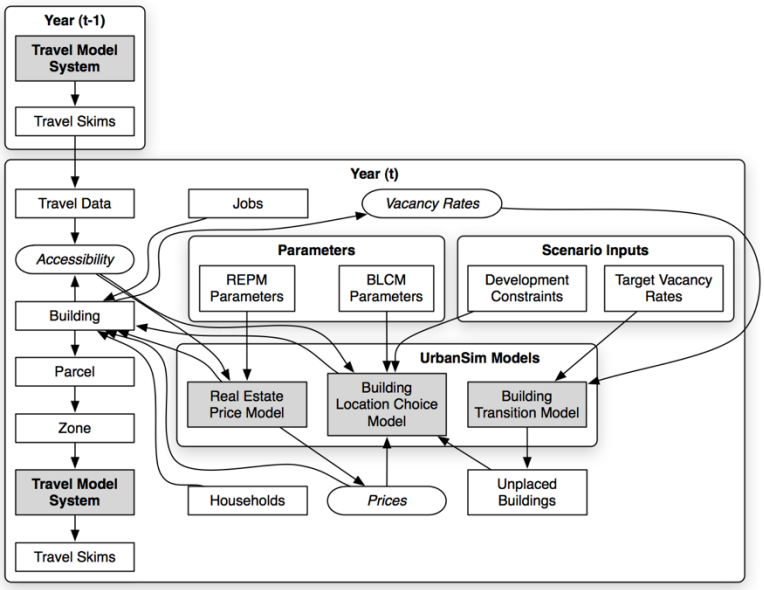


FIGURE 3: URBANSIM MODEL FLOW: REAL ESTATE FOCUS

8. The *Employment Location Choice Model* predicts the location choices of new or relocating establishments. In this model, we predict the probability that an establishment that is either new (from the Business Transition Model), or has moved within the region (from the Business Relocation Model), will be located in a particular employment submarket. Each job has an attribute of the amount of space it needs, and this provides a simple accounting framework for space utilization within submarkets. The number of locations available for an establishment to locate within a submarket will depend mainly on the total vacant square footage of nonresidential floor space in buildings within the submarket, and on the density of the use of space (square feet per employee). This sub-model simulates the behavior of businesses moving to suitable locations within the region.

9. The *Household Location Choice Model* predicts the location choices of new or relocating households. In this model, as in the business location choice model, we predict the probability that a household that is either moving into the region (from the Household Transition Model), or has decided to move within the region (from the Household Relocation Model), will choose a particular location defined by a residential submarket. This sub-model simulates the household behavior in selecting a neighborhood based on their sociodemographic preferences.

10. The *Real Estate Price Model* predicts the price per unit of each building. UrbanSim uses real estate prices as the indicator of the match between demand and supply of land at different locations and with different land use types, and of the relative market valuations for attributes of housing, nonresidential space, and location. This role is important to the rationing of land and buildings to consumers based on preferences and ability to pay, as a reflection of the operation of actual real estate markets. Since prices enter the location choice utility functions for jobs and households, an adjustment in prices will alter location preferences. All else being equal, this will in turn cause higher price alternatives to become more likely to be chosen by occupants who have lower price elasticity of demand. Similarly, any adjustment in land prices alters the preferences of developers to build new construction by type of space, and the density of the construction.

Model Estimation, Calibration, and Review

Each of Bay Area UrbanSim's components is estimated individually and then assembled into a comprehensive system that is calibrated and reviewed. The household and employment transition models are simply an outcome of the regional control totals divided into annual increments. The relocation models probabilities derived from the census and time series establishment data. The household and employment location choice models are estimated using logit models describing current locations as a function of various factors. The real estate price model are hedonic regressions that were built using recent residential transaction records and commercial rents. Finally, the real estate development model is assembled using output from the other components, industry estimates for building costs, and standard financial assumptions.

Once the components are functioning, UrbanSim is run as a whole. The forecast output was then compared to historical growth patterns and critiques by planners at MTC and the jurisdictions. When an effective argument was made and seen as widely valid, the model system would be adjusted. A number of additional independent variables were added to the location choice and hedonic models in this manner. The model was also calibrated to shift growth based on expert judgement. For instance, ABAG planners felt that no jurisdictions or major shopping centers were likely to lose employment so this as disallowed. Finally, extensive review of model output with many of the region's jurisdictions led to the correction of various errors in the land use policy database. While these modifications had little impact on the overall regional distribution of forecasted growth, they greatly improved model realism at the local level.

EIR Alternatives

For the EIR analysis, UrbanSim was used to generate five different alternative land use scenarios for future growth in the Bay Area. Each of these uses identical control totals representing future economic and demographic change but employs different policies constraining or promoting particular types and intensities of real estate development in particular locations. The first alternative is called the No Project and represents the expected trajectory of the region without the implementation of the proposed Plan or any of its alternatives. All policies in the No Project Alternative are determined or extrapolated from existing base year plans and policies. The second alternative is called the proposed Plan and uses a set of policy levers to achieve the general spatial distribution of future households and employment envisioned by ABAG planners. Within UrbanSim, the proposed Plan Alternative starts with base year policies but modifies some of these to achieve its goal of focusing growth in defined compact, accessible, and politically feasible locations called Priority Development Areas (PDAs).

Similarly, the other three alternatives modify existing policies in different ways to provide a range of potential futures that aim to accomplish the goals pursued within the proposed Plan. The Big Cities Alternative modifies policies to focus growth within the region's three largest cities (San Jose, San Francisco, and Oakland) and their closest neighbors. The Main Streets Alternative aims for a region more compact than projected by the No Project Alternative but less focused than either the Preferred Plan or the Big Cities alternatives. Finally, the Environment, Equity and Jobs (EEJ) Alternative promotes housing growth in locations that are job rich and/or are "communities of opportunity" offering high quality schools and services to residents.

Travel Model Interaction

Bay Area UrbanSim and the Travel Model work as a system to capture the interaction between transportation and land use. Accessibility to a variety of urban features is a key driver in both household and business location choice. For instance, households often prefer locations near employment, retail, and similar households but avoid other features such as industrial land use. Business preferences vary by sector with some firms looking for locations popular with similar firms (e.g. Silicon Valley) while others desire locations near an airport or university. In all cases, the accessibility between a given location in the region (defined as a Transportation Analysis Zone or TAZ) and all other locations/TAZs is provided to UrbanSim by the Travel Model. These files represent overall regional accessibility for future years considering changing infrastructure.

Moving in the other direction, UrbanSim provides the Travel Model with a projected land use pattern and spatial distribution of activities for each year into the future. This pattern incudes the location of housing, jobs, and other activities that serve as the start and end locations for trips predicted by the Travel Model. This information was provided to the Travel Model at a TAZ level aggregation for each future year examined. Overall, the linkages between the two models allow land use patterns to evolve in relation to changes in the transportation system and for future travel patterns to reflect dynamic shifts in land use.

Chapter 2: Input Assumptions

This chapter describes the Bay Area UrbanSim base year database and assumptions for the various EIR alternatives. Key variables, data sources and processing steps are described, and selected variables are profiled or mapped to illustrate trends, and assess reasonableness. The year 2010 was selected as the base year for the parcel-based model system. The Bay Area UrbanSim application operates at the level of individual households, jobs, buildings, and parcels. Jobs and households are linked to specific buildings, and buildings are linked to parcels.

In the sections below there are tables of the base distribution of employment, population, and buildings in the Bay Area. In some cases, incomplete or inconsistent data was imputed using more-aggregate household or employment counts. The base-year database contains around 2.6 million households (not including group quarters), 3.4 million jobs, 1.9 million buildings, and 2 million parcels, based on information from the U.S. census, Dunn & Bradstreet establishment data, the CoStar commercial real estate database, and county assessor parcel files.

Base Year Spatial Database

Bay Area UrbanSim uses a detailed geographic model of the Bay Area. A geographic information system was used to combine data from a variety of sources to build a representation of each building and property within the region. These detailed spatial locations are grouped into TAZs to improve model flow and provide summary output. Because this database represents the current state of the Bay Area's land use pattern, it is used as an identical starting point for all five alternatives.

Parcels

Parcels, or individual units of land ownership, provide a fundamental building block for the Bay Area UrbanSim model: in both the real world and the model they are the entity that is owned, sold, developed, and redeveloped by households and businesses. In a given year, each parcel is associated with 0, 1, or multiple buildings that provide space for activities. The UrbanSim parcel database includes information linking the parcels to zones they are within, buildings that are on them, their size, their monetary value, and their current planning constraints.

Buildings

The base year database contains around 1,900,000 buildings categorized into 14 different types as seen in Table 2. Households and businesses are assigned to buildings and buildings are linked to a parcel. Each building has attribute information on its size, age, and value, among other things. The building database is modified by the Real Estate Development Model as it tears down buildings and constructs new buildings. The base year (2010) configuration for the buildings database is the same for all EIR Alternatives. Figures 4 and 5 map out illustrative building attributes at the zonal level.

TABLE 2: BUILDING TYPES AND 2010 COUNTS

Building Type	*2010 Count*
Single Family Detached	1,479,666
Single Family Attached	207,088
Multi-Family	102,022
Office	37,105
Hotel	2437
School	3184
Light Industrial	21,491
Warehouse	10,999
Heavy Industrial	1539
General Retail	41,870
Big-Box Retail	1678
Mixed-Use Residential	7375
Mixed-Use Retail-Focus	1379
Mixed-Use Employment-Focus	735

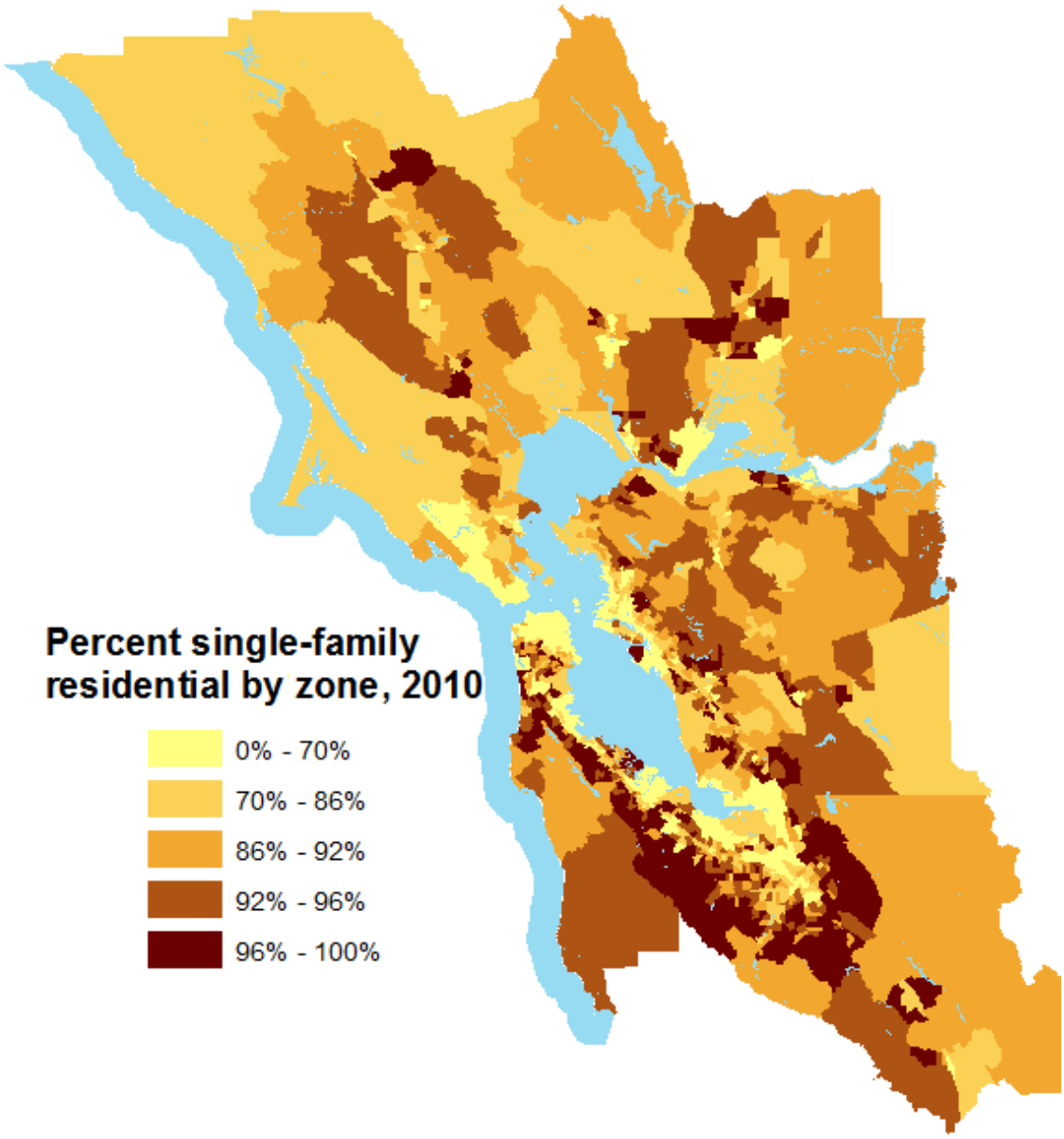


FIGURE 4: PERCENT SINGLE FAMILY RESIDENTIAL BUILDINGS, BY TRAVEL ANALYSIS ZONE (TAZ)

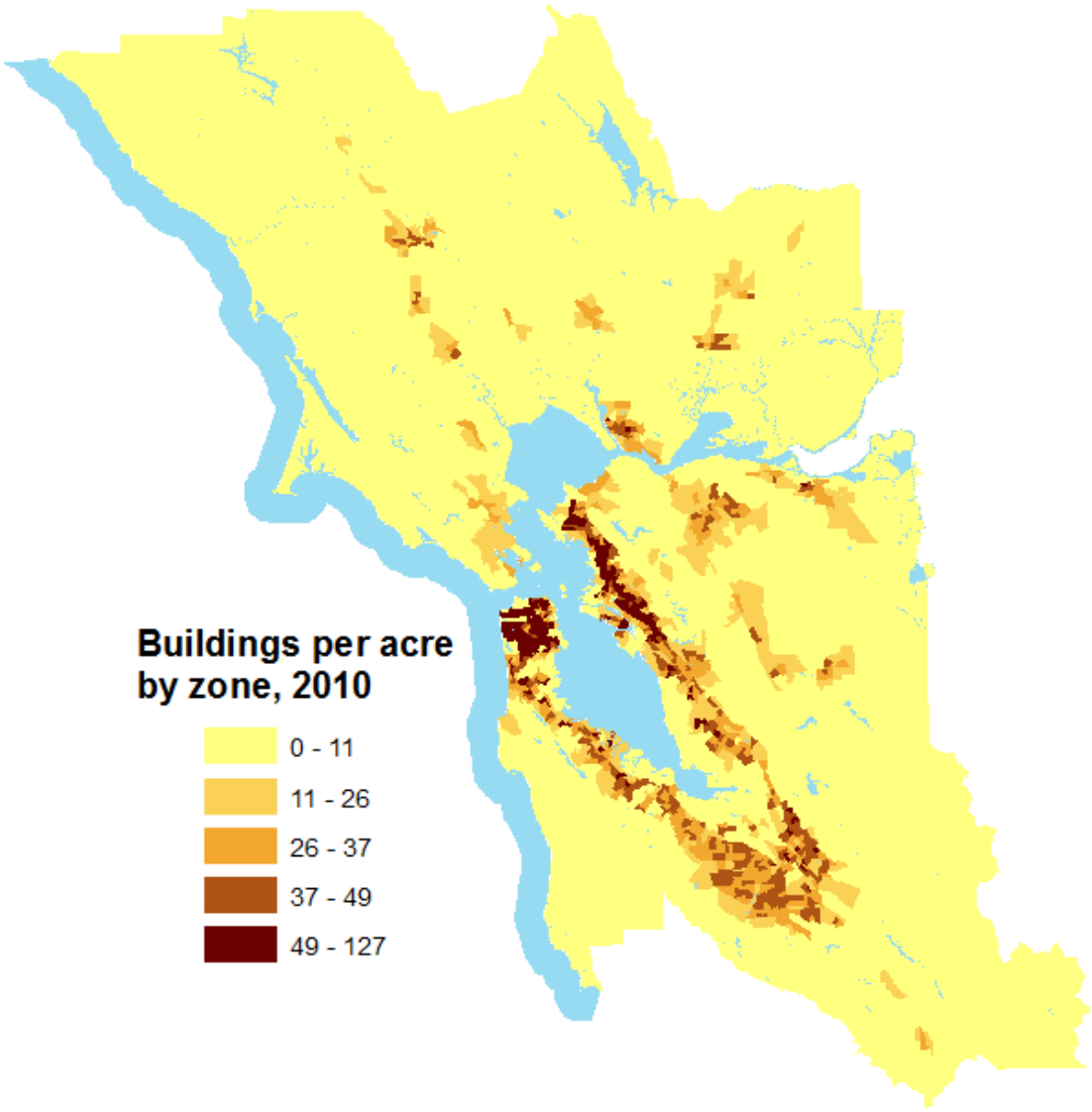


FIGURE 5: BUILDINGS PER ACRE, BY TRAVEL ANALYSIS ZONE

Because buildings are a fundamental nexus in UrbanSim where the physical real estate market interacts with the households and employees who occupy the structures, a variety of key assumptions relate to buildings. While these assumptions greatly simplify the complexity of the region's land use market, they remain identical across EIR Alternatives allowing for consistent comparisons.

Two interrelated factors combine to determine how employees occupy buildings. First, workers in particular sectors use various types of buildings at different rates. For instance, many business service workers will use office buildings but a smaller number will occupy the same amount of light industrial space. The second step looks at the amount of square feet different types of workers use. Both of these use factors (types and amounts of space) were compiled on average for the entire region and assumed to be constant into the future.

Finally, UrbanSim provides flexibility in the representation of subsidized construction. A separate component described above (the Scheduled Development Event Model) allows the construction of predetermined buildings in set future years. This list includes two types of projects: 1) buildings built between 2010 (the model forecast start year) and 2016 (the present year when the alternatives were created), or 2) larger projects to be built with a mixture of public and private funding, that are currently under construction or funded. This definition led to the inclusion of around 246,000 new housing units and 155 million new commercial square feet (though the net amounts for both were moderately lower on account of redevelopment) between 2010 and 2040. The same list of assumed projects was used for all EIR Alternatives.

Regional Growth Projections

Projections for the region's overall rate of economic and demographic growth are developed by ABAG external to the land use modeling process.[4] Summary information on these inputs to the Bay Area UrbanSim model is presented below.

Annual Business Control Totals

The total number of employees by sector within the region is forecasted by ABAG and fed into UrbanSim. This information is used to generate new business establishments that in turn generate overall demand for commercial real estate. After new establishments are assigned locations by the Business Location Choice Model, the overall spatial distribution of employment provides input into the travel model's representation of personal travel.

ABAG's economic projections for the Bay Area are provided for the years 2010, 2015, 2020, 2025, 2035, and 2040 while intermediate years are interpolated. As seen in Table 2, the overall regional count of employment is projected to grow from around 3.4 million jobs in 2010 to almost 4.7 million jobs by 2040, or 37.7 percent. These control totals also project a changing sectoral distribution over the projection period: employment in agriculture and natural resources declines over the period while the fastest growing sectors are professional services and business services.

[4] Please see the *Forecasting Report* for the details of how these control totals were generated.

TABLE 3: HOUSEHOLD AND EMPLOYMENT REGIONAL CONTROL TOTALS

Year	*Households*	*Employment*
2010	2,609,000	3,410,853
2015	2,760,479	4,010,134
2020	2,881,967	4,136,190
2025	3,009,055	4,267,761
2030	3,142,016	4,405,126
2035	3,281,131	4,548,564
2040	3,426,700	4,698,374

Annual Household Control Totals

The total number of households by income category within the region is forecasted by ABAG externally to UrbanSim.[5] This information is used to understand the overall demand for housing. In addition to the new households, the division of existing households into income categories is used to segment the population when considering relocation rates in the Household Transition Model. The forecasted new households and relocating households are allocated among the TAZs using the Household Location Choice Model. This spatial distribution of households is input into the Travel Model's representation of personal travel.

ABAG's demographic projections for the Bay Area are provided for the years 2010, 2015, 2020, 2025, 2035, and 2040 while intermediate years are interpolated.

As seen in Table 3 above, the overall regional count of households is projected to grow from around 2.6 million households in 2010 to over 3.4 million households by 2040, or 31.3 percent. These control totals also project a changing income distribution over the projection period: the share of households in each quartile (from lowest to highest income) is projected to shift from 27%/26%/23%/24% in 2010 to 28%/22%/22%/28% in 2040.

[5] Please see the *Forecasting Report* for the details of how these control totals were generated.

Model Agents

Choices by key actors or agents in the Bay Area are the foundation of the UrbanSim Model. The three classes of agents are households choosing places to live, business establishments choosing locations to do work, and real estate developers choosing places to build new buildings. This section discusses inputs related to each agent. Because these represent the fundamentals of the urban economy, input values are consistent across EIR Alternatives.

Households and People

UrbanSim represents each household individually. A 2010 household table with approximately 2,600,000 households is synthesized for the region from Census 2010 Public Use Micro-Sample (PUMS) and Summary File 3 (SF3) tables using the PopGen population synthesizer.[6] This process creates a row for each household and gives each characteristics such as number of persons and income so that the overall averages for those characteristics conform to the census information provided for that location. These households have a mean persons per household of 2.7, a mean number of household workers of 1.39, mean age of household head of 48.6 years, a mean household income of $81,937, and a mean number of household children of 0.53.

Establishments and Employees

Establishments are the other major class of agent in UrbanSim. They represent a unique location of employment for a business. For example, a one-off barbershop is one establishment and so is one particular McDonald's restaurant location. Each establishment contains a number of employees. For the Bay Area UrbanSim model, the 2010 distribution of establishments and their employees are used as input. Future year projections are then made by modeling the movement of individual establishments.

The 2010 establishment database was built by combining establishment data from the Dunn & Bradstreet and EDD[7] datasets and then transforming it to conform to ABAG's subregional employment totals.[8] Each establishment was assigned to one of the 6 sector classes[9] and associated with an appropriate building. Each of these sectors is modeled separately in the Employment Location Choice Model. Because no clear relocation trends were readily observable in historic data, a 1.9 percent chance of relocating was assumed for employment each year, regardless of sector. All employment assumptions are the same for all EIR Alternatives.

[6] http://urbanmodel.asu.edu/popgen.html

[7] http://www.labormarketinfo.edd.ca.gov/

[8] All employment databases contain slightly different counts due to different definitions, data collection strategies, and error. For more information on ABAG's regional control totals please see the *Forecasting Report*

[9] The employment classifications can be found in the *Forecasting Report*

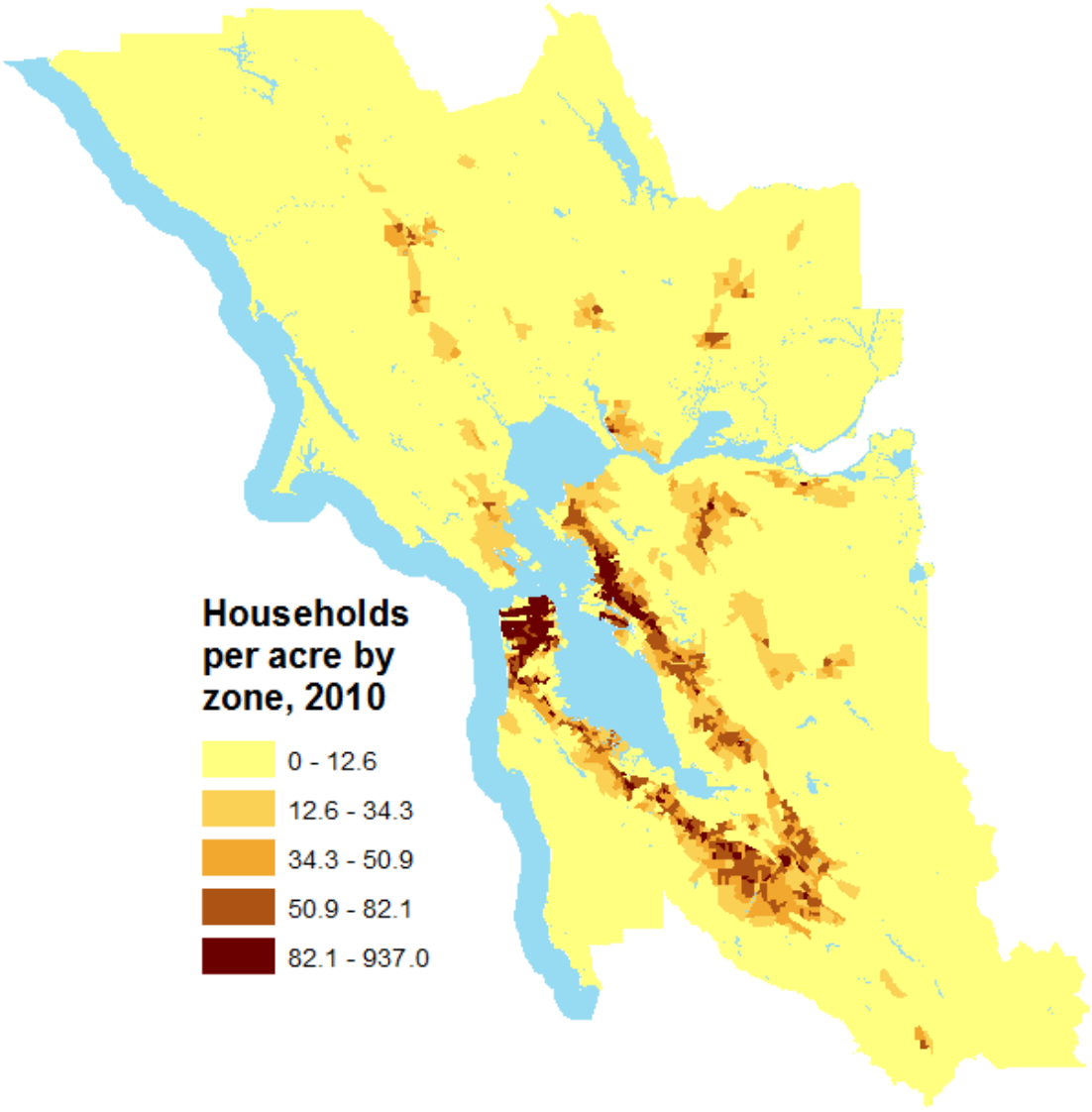


FIGURE 6: SYNTHESIZED HOUSEHOLDS PER ACRE, BY TAZ

Real Estate Developers

The final UrbanSim agent is a special class of business: the real estate developer. Developers monitor the relationship between supply and demand for different types of buildings across the region and attempt to build new structures in locations where they can make a profit. They are driven by market forces so assumptions related the real estate developers are identical across the five EIR Alternatives.

UrbanSim implements the Real Estate Developer Model as a stochastic, or randomly defined, pro-forma model that explicitly treats these decisions the same way they are made in the real world. The pro forma combines information on costs and income over a proposed project's lifetime, allowing an assessment of overall profitability. The model examines all parcels each year and tests various project concepts allowed under the site's zoning constraints. The developer chooses the project that maximizes profit and builds the project if it is profitable. After a construction period, these new buildings are available to households and businesses for occupation.

Land Use Policy Levers

Policy makers can apply certain incentives or disincentives — financial or regulatory — to try and influence land use. These are referred to as "policy levers." Differences in the policy lever inputs are the fundamental means of representing the different EIR Alternatives. The policies represent actions that MTC, ABAG, or partner agencies such as the cities and counties could take or seek legislation to allow. These input assumptions vary greatly between alternatives and, when combined with the more fundamental agents described above, produce model outputs.

Zoning

Current zoning was obtained for all parcels in the region as a representation of the land use controls in place during the base year. Zoning codes, general plans, and specific plans were processed to obtain a consistent indication of each jurisdiction's long-term vision for land use type, residential dwelling units per acre, and commercial floor-area-ratio.[10] Cities and counties were offered the opportunity to review the data for accuracy. Adjustments to zoning were made in some locations to put protected land, government land, and transportation corridors off limits to development. Additionally, parcels containing structures built before 1930 were also deemed non-developable as a rough representation of historical protection ordinances until better data can be obtained. Existing general plans and zoning ensure required land use compatibility for most locations within two miles of the region's airports. Some locations within this area were upzoned but the additional capacity fits within the airport planning envelope.

[10] Zoning or general plan data was collected for all jurisdictions. Due to time constraints, specific plans were only collected for a limited subset of areas where such information was expected to exhibit a great deal of variation from the other planning information. In general, constraints on new development were drawn from the information source judged most likely to represent a jurisdiction's long term expectations for development maximums at each location.

All alternatives start with this basic zoning classification. For each alternative, zoning modifications are made for various subsets of parcels in the region. The No Project Alternative assumes current land use regulations as captured in the base zoning do not change between now and 2040. In the proposed Plan Alternative, zoning is modified to reflect the classification of ABAG's Priority Development Areas into various place-types (if these require intensities higher than existing zoning allows). For each PDA, the allowable building types are broadened and intensities increased. Similarly, in the Big Cities Alternative zoning is changed in Transit Priority Areas (TPAs) within the three largest cities and their neighbors in order to encourage growth near transit.

The Main Streets Alternative increases zoning intensities in the PDAs but to a lesser amount than the proposed Plan Alternative in order to create a slightly less dense but still focused land use pattern. The Equity, Environment and Jobs (EEJ) Alternative broadens use types and increases residential densities in a selection of both PDAs and Transit Priority Areas (TPAs) in particular jurisdictions to encourage low income housing in job-rich communities. Figure 10 provides an overview of zoning overlays by alternative.

TABLE 4: UPZONING ACROSS THE ALTERNATIVES

	Upzoning Geography	*Typical Upzoned Dwelling Units per Acre*	*Highest Upzoned Dwelling Units per Acre*
Proposed Plan	PDAs	50	140
Main Streets	PDAs	60	95
Big Cities	TPAs in Big 3 and neighbors	70	125
EEJ	Select PDAs	50	120

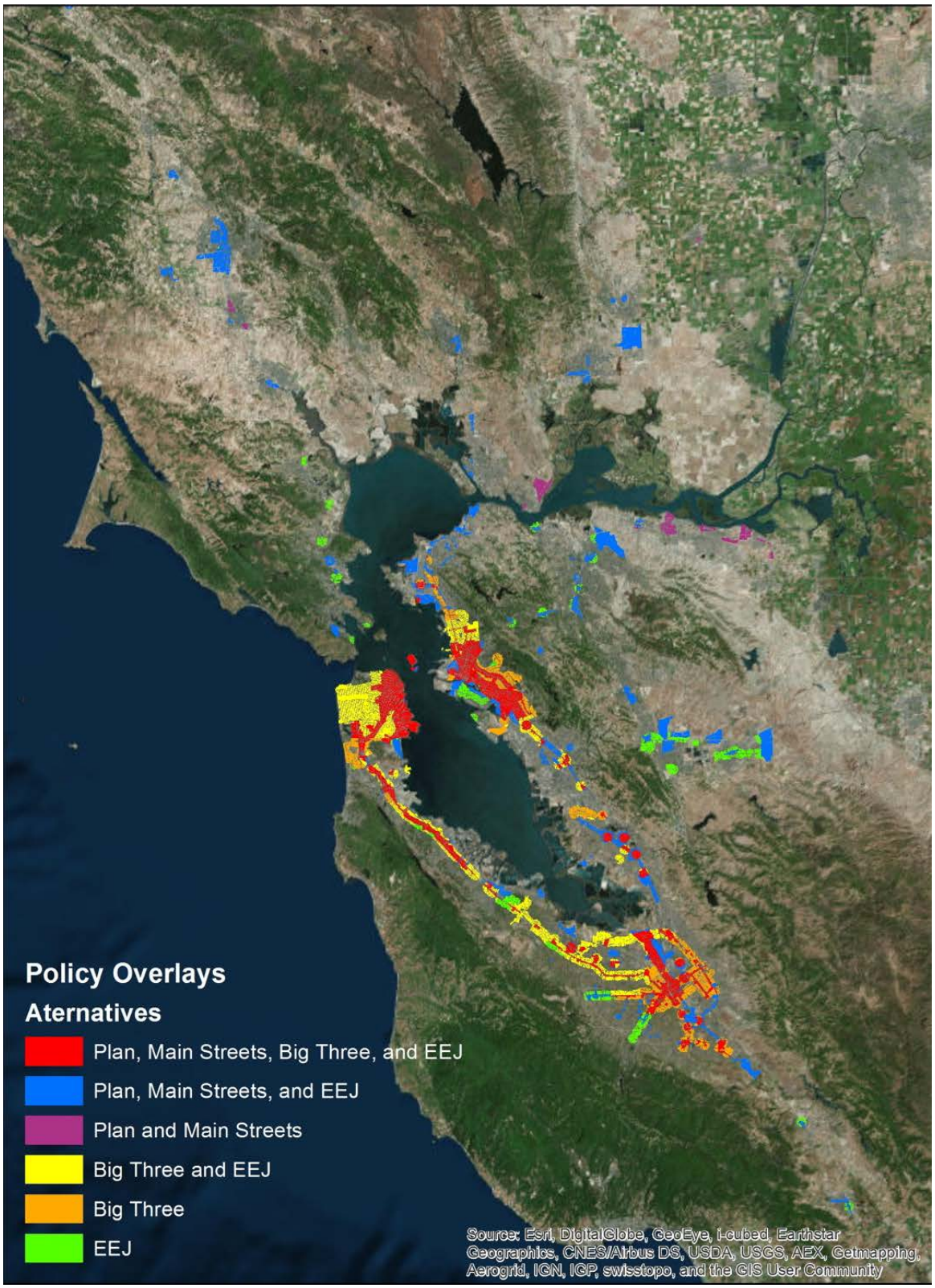


FIGURE 7: ZONING OVERLAYS ACROSS THE ALTERNATIVES

Urban Boundary Lines

For the purpose of building EIR alternatives, a consistent set of "Urban Boundary Lines" surrounding each city was established. These are meant to function like urban growth boundaries in the EIR alternatives that stress the implementation of regional urban growth boundaries. In some cases, the Urban Boundary Lines are drawn from true urban growth boundaries or urban limit lines. In other cases existing city boundaries are used to establish the Urban Boundary Line for EIR analysis.

The Urban Boundary Lines are treated two different ways across EIR Alternatives. In the No Project and Main Streets alternatives they are assumed to be weakly enforced meaning that some suburban growth will be allowed to spill out past them. In the other three alternatives, the enforcement is assumed to be strict, meaning that all Urban Boundary Lines are strictly enforced as urban growth boundaries and suburban growth is not allowed beyond them. In all alternatives, low density rural residential growth is permitted beyond the Urban Boundary Line in locations where the base year zoning allows it.

In the No Project and Main Streets alternatives, the amount and location of growth beyond the Urban Boundary Lines must be determined. (In the forecast this can be thought of as land that is expected to become incorporated during the next three decades, either through city expansion or the formation of new cities.) This is done by changing the zoning to suburban densities in particular locations and letting the UrbanSim modeling system decide how much growth to place in those locations based on its representation of the regional land market. 389 square miles of land was upzoned to typical suburban densities (i.e. the maximum housing units per acre and Floor-Area Ratio (FAR) were increased and single-family dwellings, retail, and office uses were added as allowable) for this alternative based the ratio of new incorporated land to population growth during the past three decades. Upzoned land was located within the region using a simple rule-based model that prioritized parcels that were near divided highways and had low slope within a five-mile radius (i.e. areas posited as most likely to incorporate). All land in this area was considered available in the base year. See Figure 11 for the assumed Urban Boundary Lines and their expansion in the No Project Alternative.

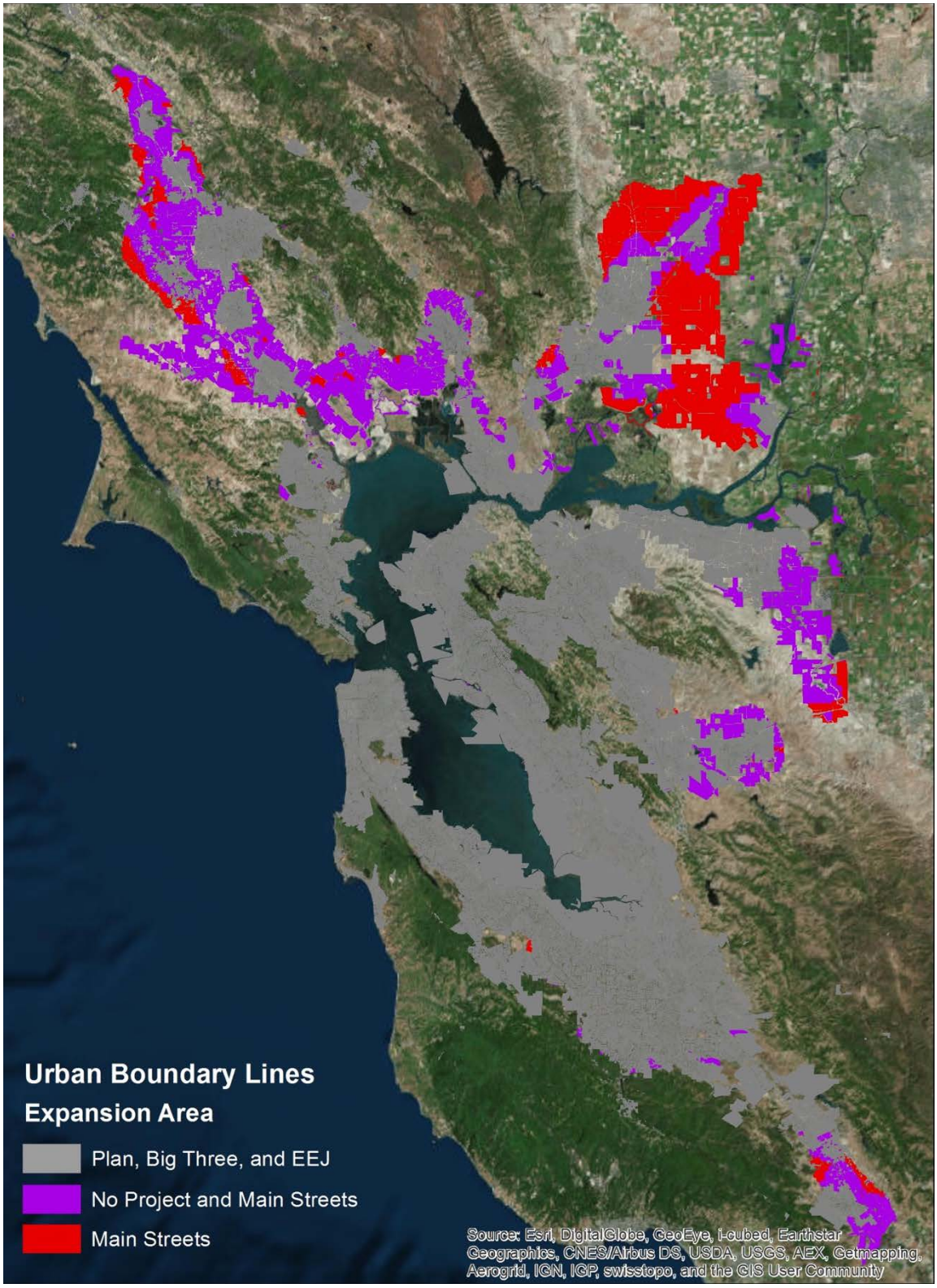


FIGURE 8: URBAN BOUNDARY LINES ACROSS THE ALTERNATIVES

California Environmental Quality Act Tiering

To encourage land use planning and development that is consistent with a Sustainable Communities Strategy (SCS), Senate Bill (SB) 375 includes California Environmental Quality Act (CEQA) provisions that can be used by lead agencies to streamline projects that align residential development with transit. It is anticipated that most projects that are able to take advantage of the streamlining will qualify for a limited analysis EIR which would reduce the time required to complete the environmental review, and thus reduce the time it takes to construct a project. This time savings translates into a cost savings for the developer which makes development slightly more likely to occur within TPAs. However, the streamlining time savings is assumed to be modest: on the order of 1 to 3 months in the model. Because no data exists at this point in California or a similar context as to the exact value of this streamlining, a 1 percent savings has been assumed for appropriate projects. Although it is at the discretion of local jurisdictions to determine the appropriateness of using the streamlining provisions in SB 375, the model assumes that this benefit is offered to all projects that meet the density and intensity requirements and are within a TPA. CEQA Tiering benefits are identical in the proposed Plan, Big Cities, Main Streets, and EEJ alternatives. The CEQA streamlining benefits are not present in the No Project alternative.

One Bay Area Grant Program

The One Bay Area Grant (OBAG) program provides preferential subsidy over the next four years to cities that accept and build housing per the Regional Housing Needs Allocation (RHNA) process. The modeling approach here assumes all jurisdictions will comply with the mandatory complete streets policy and certified housing element requirements and that all OBAG funding is spent in the PDAs with an equal percentage of the county level funding going to each PDA. Additionally, for simplicity all funding is allocated in the model at the start of the modeled time period.

OBAG funding is represented as an increase in the attractiveness of PDAs to development. While some studies have attempted to capture the local impact of pedestrian and other TOD improvements on land values, no one has examined the overall impact of a regional program of this nature on property values or on redirecting the spatial distribution of new development. For now, we assume that the OBAG program results in an increase in profitability of $30,000 per residential unit for residential buildings and $4 per square foot for non-residential buildings in all PDAs. These values are in line with previous studies.[11] A better understanding of the precise impacts of the OBAG program will come after a few years of implementation.

Senate Bill 743

California Senate Bill 743 is an effort (ongoing at the time of Plan preparation) to change the manner in which the assessment of significance for under the California Environmental Quality Act (CEQA) is assessed. Traditionally, CEQA analysis has examined potential transportation impacts using the Level of Service (LOS) concept where impact significance occurs when highway facilities exceed a particular level of congestion. LOS assessments in dense urban areas often reveal high levels of existing congestion

[11] For example, please see CABE: *Paved With Gold: The Real Value of Good Street Design*. June 2007.

http://www.cabe.org.uk/files/paved-with-gold.pdf.

leading to frequent finding of significance and expensive mitigation requirements. SB743 shifts analysis to a Vehicle Miles Traveled (VMT) method that is more likely to find transportation impacts in car-oriented suburban locations. Because the exact implementation of SB743 is still being worked out, it is proxied here has a slight (1-2%) increase in costs in suburban locations and a slight (again 1-2%) decrease in costs in urban locations with the amount of shift determined by zone level average VMT for commute trips originating in that zone. This policy is applied in all alternatives except the No Project.

Inclusionary Zoning

As regional housing prices increase, various stakeholders have been interested in land use policies to produce housing for lower income households. For example, inclusionary zoning is a requirement that new residential construction include a set percentage of units that are available exclusively to low income residents. Here, the policy requires that any new residential construction provide the percentage of units required in each location within an alternative. The land use model reflects the challenges of building projects that have lower revenue but the same costs with some otherwise feasible projects shifting to other locations. When projects are built with inclusionary units, those units are only available to households in the lowest income quartile. Inclusionary zoning is required in jurisdictions that contain PDA for the Main Streets (5% inclusionary rate), the Proposed Plan (10%), and the EEJ alternatives (20%). The Big Cities alternative requires a 20% rate but only in the region's three largest cities (San Jose, San Francisco, and Oakland).

Regional Development Fees and Subsidies

In two alternatives, a development fee is assessed for certain types of new development in high VMT locations and transferred as a subsidy to areas of low VMT. In the Preferred Alternative, fees are assessed on the development of new office spaces in zones with high average VMT for workers with jobs in that TAZ. Potential projects in areas with the highest VMT per existing commute are charged a $50-per-square-foot fee. This decreases to $3 in more central, but still auto-oriented parts of the region. Highly accessible, low-VMT locations have no fees assessed. These fees make some potential projects infeasible, causing them to locate in more VMT-efficient locations. The projects that are built in high VMT locations contribute to a fund that subsidizes deed-restricted, low-income housing within the PDAs. In the Big Cities Alternative, new residential development is charged a fee based on the average VMT generated by workers with homes in that TAZ. This fee ranges from $25,00 per unit in very distant, high-VMT locations to $5000 for more central, but not transit accessibly areas. Construction in very efficient areas is not assessed a fee. The fee discourages residential construction in these locations and shifts development to more efficient locations. Projects that are built contribute to a fund that subsidizes deed-restricted residential construction in the PDAs.

Parcel and Housing Capital Gains Taxes

The Main Streets Alternative employs two methods of directly subsidizing deed-restricted low income housing. A tax of $24 per parcel raises around $42 million annually to be spent subsidizing affordable housing in any PDA throughout the region. A capital gains tax on some profit made from housing raises $500 million dollars to similarly be spend on subsidized housing in the PDAs.

Reduced Parking Minimums

In all of the alternatives except the No Project, the reduction of required parking minimums for new construction was reduced to encourage cheaper infill housing. Time limitations disallowed the collection of a full parking requirement database for the Bay Area. Instead, a subsidy of 1 percent per potential unit was applied to all parcels within the potentially upzoned area relevant to each alternative (the relevant zones are PDAs, TPPs, or some combination of the two as seen above in Figure 9). This number represents a basic estimate of potential savings assuming that around one-fifth of new units would be able to be built with one less parking space.

Chapter 3: Key Results

Selected land use model results are summarized and discussed here. The output presented is partial and intended to give a general sense of expected behavioral change across the alternatives and through the projection years. Emphasis is given to results that 1) influence the Travel Model, 2) affect Plan Bay Area 2040 target results, and 3) provide a context for understanding the regional development change predicted by each alternative.

Regional Land Use Outcomes

The overall regional distribution of population and employment growth provides a simple means of comparing the land use model outcomes for the five EIR Alternatives. Figure 13 assigns the region's superdistricts into four large categories: the Big Cities (San Jose, San Francisco, and Oakland), the rest of the region's Core, the Suburban areas over the first range of hills, and the Inland areas.[12] Because the figures are based on superdistricts, the boundaries do not all align with jurisdictional boundaries. Table 5 shows the regional share of households in 2010 and for each alternative in 2040. Table 6 shows the regional share of employment in 2010 and for each alternative in 2040.

[12] Boundaries are approximate due to pre-determined superdistrict boundaries and category labels are only intended to be descriptive.

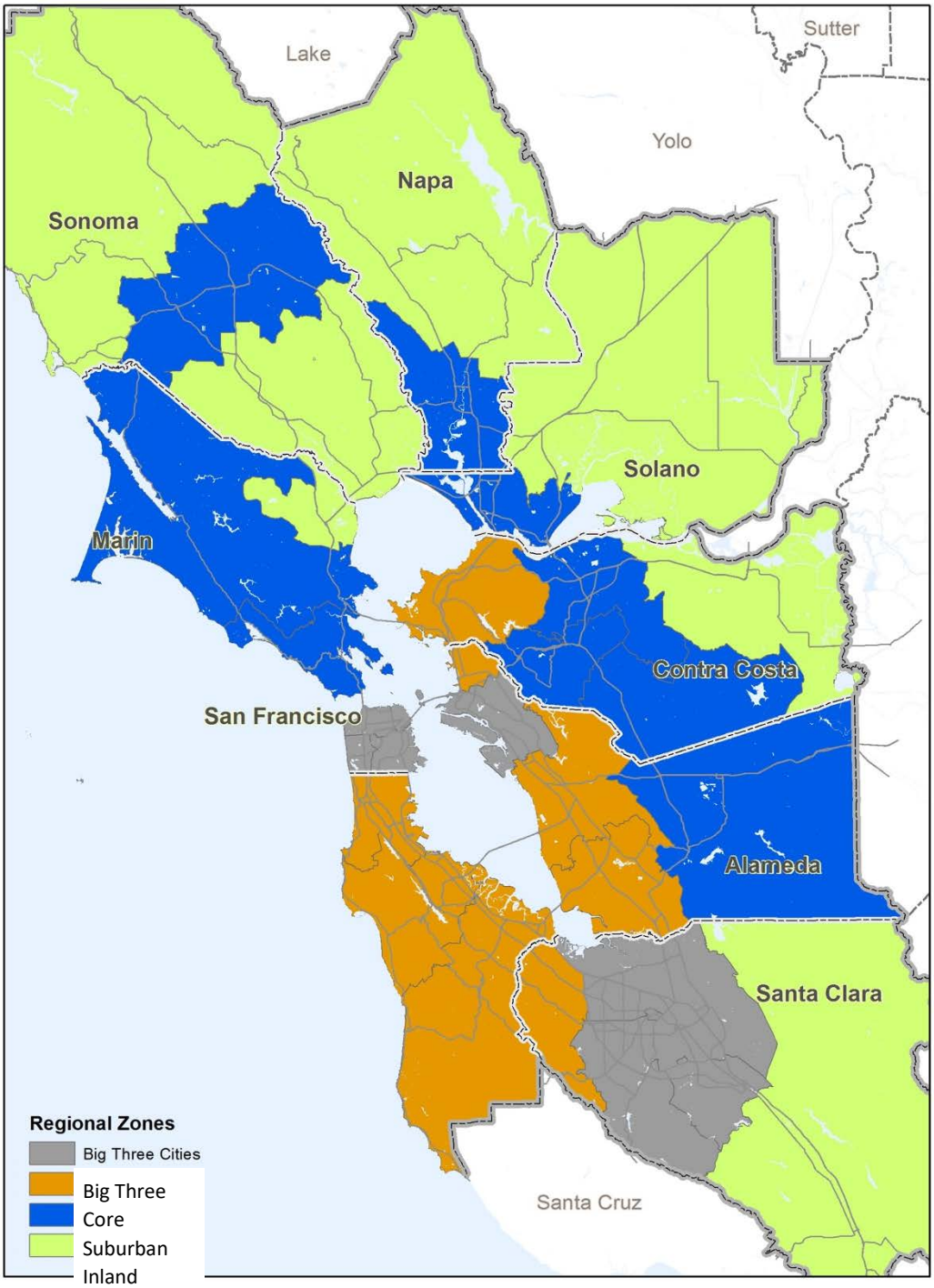


FIGURE 9: REGIONAL ZONES

TABLE 5: REGIONAL SHARE OF HOUSEHOLDS ACROSS ALTERNATIVES

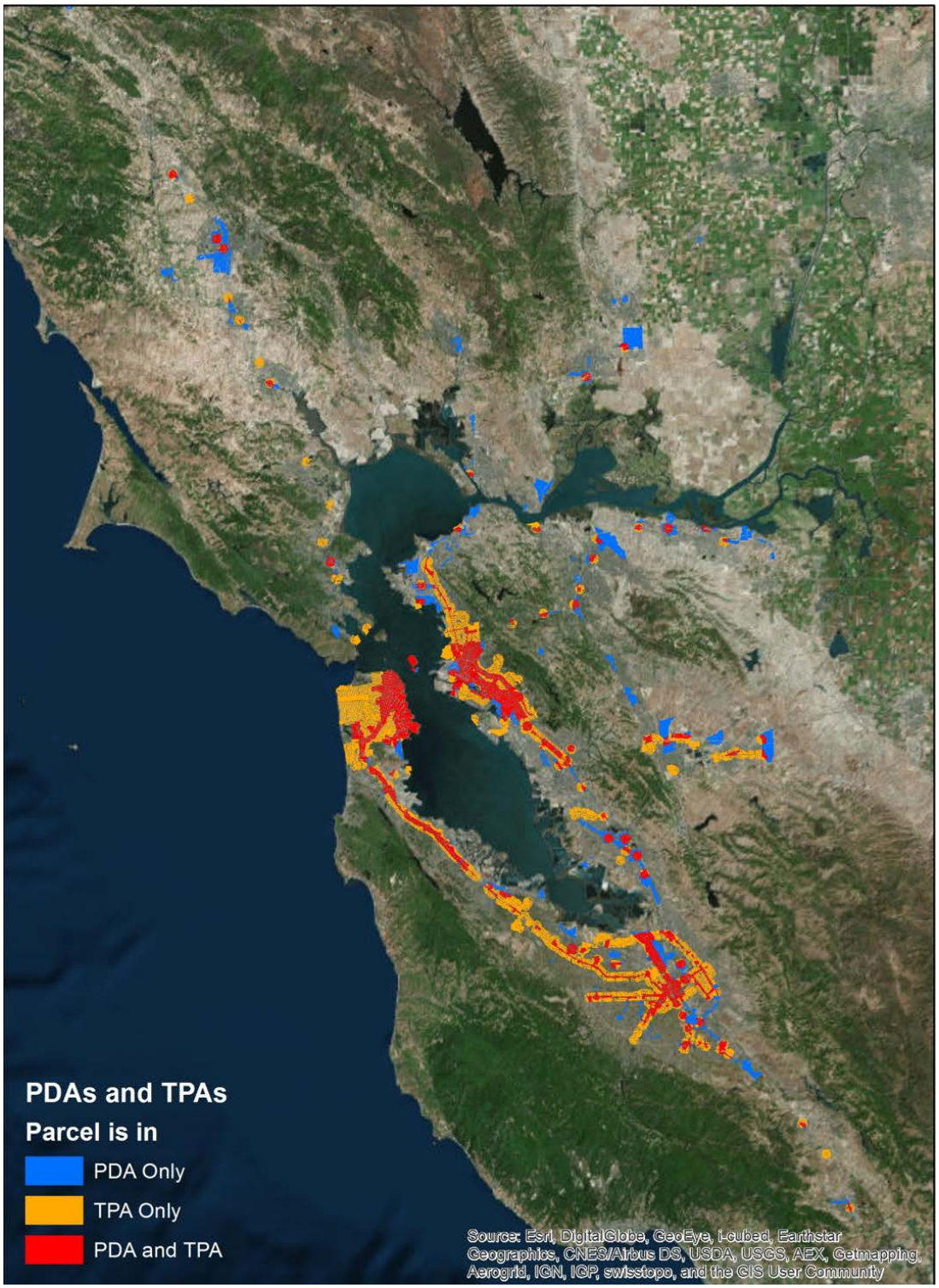
Area	*2010*	*Alternative 2040*				
		No Project	*Proposed Plan*	*Main Streets*	*Big Cities*	*EEJ*
Big Cities	40%	39%	43%	44%	47%	42%
Core	27%	25%	26%	25%	25%	26%
Suburban	20%	20%	18%	19%	17%	19%
Inland	13%	16%	12%	12%	11%	13%

TABLE 6: REGIONAL SHARE OF EMPLOYMENT ACROSS ALTERNATIVES

Area	*2010*	*Alternative 2040*				
		No Project	*Proposed Plan*	*Main Streets*	*Big Cities*	*EEJ*
Big Cities	43%	47%	47%	46%	47%	47%
Core	28%	27%	27%	27%	27%	27%
Suburban	20%	18%	18%	18%	18%	18%
Inland	10%	8%	8%	8%	8%	8%

Small Zone Outcomes

While the regional distribution of households and employment will influence travel behavior, a more micro-level understanding of growth is also fundamental in understanding each alternative's ability to achieve transportation and other goals. PDAs are the zones created through a multi-year partnership with local jurisdictions that are seen as a preferred location for urban growth in the proposed Plan. PDAs aim to provide transit and pedestrian accessibility to urban services. TPAs are zones defined by SB 375 as being within a half mile of a major transit stop or within one-quarter of a mile of high-quality transit corridors. TPAs cover a larger portion of the region and are more tightly focused on transit accessibility. Figure 14 show PDAs, TPAs and areas of overlap. Table 7 provides the share of households in PDAs and TPAs for 2010 and the alternatives in year 2040. Table 8 shows similar information for employment shares.



Note: This map uses Draft 2016 TPAs; refer to the Statutory-Regional Plan Maps for final TPAs.

FIGURE 10: PDAS AND TPAS

TABLE 7: SMALL ZONE SHARE OF HOUSEHOLDS ACROSS ALTERNATIVES

Area		*Alternative 2040*				
	2010	*No Project*	*Proposed Plan*	*Main Streets*	*Big Cities*	*EEJ*
PDAs	23%	26%	35%	36%	31%	34%
TPAs	40%	40%	44%	44%	46%	44%

TABLE 8: SMALL ZONE SHARE OF EMPLOYMENT ACROSS ALTERNATIVES

Area		*Alternative 2040*				
	2010	*No Project*	*Proposed Plan*	*Main Streets*	*Big Cities*	*EEJ*
PDAs	47%	45%	46%	43%	45%	46%
TPAs	51%	52%	52%	51%	53%	53%

Appendix 1 – Household and Employment Growth Forecasts by Jurisdiction

Household Growth Forecasts

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Alameda	Alameda	Total	30,100	35,100	5,000
		PDA	1,800	5,500	3,700
	Alameda County Unincorporated	Total	48,400	56,200	7,800
		PDA	10,100	13,100	3,000
	Albany	Total	7,400	7,900	500
		PDA	320	470	150
	Berkeley	Total	46,000	55,400	9,400
		PDA	6,600	12,900	6,300
	Dublin	Total	14,900	26,500	11,600
		PDA	3,100	11,000	7,900
	Emeryville	Total	5,700	18,900	13,200
		PDA	2,300	15,100	12,800
	Fremont	Total	71,000	90,200	19,200
		PDA	23,200	40,700	17,500
	Hayward	Total	45,400	54,300	8,900
		PDA	4,400	9,500	5,100
	Livermore	Total	29,100	39,700	10,600
		PDA	860	10,400	9,540
	Newark	Total	13,000	14,100	1,100
		PDA	220	470	250
	Oakland	Total	153,800	241,500	87,700
		PDA	112,600	197,700	85,100
	Piedmont	Total	3,800	3,900	100
		PDA			
	Pleasanton	Total	25,200	30,600	5,400
		PDA	1,300	5,200	3,900
	San Leandro	Total	30,700	37,300	6,600
		PDA	4,600	10,300	5,700
	Union City	Total	20,400	22,800	2,400
		PDA	500	2,200	1,700
	County Total	**Total**	**545,000**	**734,100**	**189,100**
		PDA	**172,000**	**334,500**	**162,600**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Contra Costa	Antioch	Total	32,300	40,300	8,000
		PDA	1,400	5,300	3,900
	Brentwood	Total	16,500	26,100	9,600
		PDA			
	Clayton	Total	4,000	4,100	100
		PDA			
	Concord	Total	44,300	64,400	20,100
		PDA	3,900	21,300	17,400
	Contra Costa County Unincorporated	Total	57,700	67,700	10,000
		PDA	4,300	12,000	7,700
	Danville	Total	15,400	16,000	600
		PDA			
	El Cerrito	Total	10,100	12,100	2,000
		PDA	740	2,200	1,460
	Hercules	Total	8,100	9,700	1,600
		PDA	870	1,700	830
	Lafayette	Total	9,200	10,000	800
		PDA	1,700	2,200	500
	Martinez	Total	14,300	15,300	1,000
		PDA	710	1,000	290
	Moraga	Total	5,600	5,900	300
		PDA	30	180	150
	Oakley	Total	10,700	16,400	5,700
		PDA	770	5,900	5,130
	Orinda	Total	6,600	6,800	200
		PDA	230	330	100
	Pinole	Total	6,800	7,300	500
		PDA	360	640	280
	Pittsburg	Total	19,500	26,500	7,000
		PDA	5,100	8,600	3,500
	Pleasant Hill	Total	13,700	14,300	600
		PDA	860	1,000	140
	Richmond	Total	36,100	54,900	18,800
		PDA	8,400	24,000	15,600
	San Pablo	Total	8,800	9,800	1,000
		PDA	2,000	2,600	600
	San Ramon	Total	25,300	30,300	5,000
		PDA	220	2,000	1,780
	Walnut Creek	Total	30,400	37,500	7,100
		PDA	4,900	10,400	5,500
	County Total	**Total**	**375,400**	**475,400**	**100,000**
		PDA	**36,500**	**101,200**	**64,700**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Marin	Belvedere	Total	930	990	60
		PDA			
	Corte Madera	Total	3,800	4,300	500
		PDA			
	Fairfax	Total	3,400	3,700	300
		PDA			
	Larkspur	Total	5,900	6,400	500
		PDA			
	Marin County Unincorporated	Total	26,200	28,400	2,200
		PDA	1,400	1,800	400
	Mill Valley	Total	6,100	6,400	300
		PDA			
	Novato	Total	20,300	21,200	900
		PDA			
	Ross	Total	800	840	40
		PDA			
	San Anselmo	Total	5,200	5,500	300
		PDA			
	San Rafael	Total	22,800	25,600	2,800
		PDA	1,700	2,600	900
	Sausalito	Total	4,100	4,400	300
		PDA			
	Tiburon	Total	3,700	3,900	200
		PDA			
	County Total	**Total**	**103,200**	**111,600**	**8,400**
		PDA	**3,100**	**4,400**	**1,300**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Napa	American Canyon	Total	5,700	6,300	600
		PDA	410	490	80
	Calistoga	Total	2,000	2,100	100
		PDA			
	Napa	Total	28,200	30,600	2,400
		PDA	370	710	340
	Napa County Unincorporated	Total	9,600	11,900	2,300
		PDA			
	St. Helena	Total	2,400	2,700	300
		PDA			
	Yountville	Total	1,100	1,100	0
		PDA			
	County Total	**Total**	**48,900**	**54,700**	**5,800**
		PDA	**780**	**1,200**	**430**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
San Francisco	San Francisco	Total	345,800	483,700	137,800
		PDA	182,400	310,100	127,700

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
San Mateo	Atherton	Total	2,300	2,500	200
		PDA			
	Belmont	Total	10,600	11,600	1,000
		PDA	2,900	3,500	600
	Brisbane	Total	1,800	6,400	4,600
		PDA		4,400	4,400
	Burlingame	Total	12,400	13,700	1,300
		PDA	7,000	8,200	1,200
	Colma	Total	410	940	530
		PDA	320	760	440
	Daly City	Total	31,100	35,800	4,700
		PDA	8,500	11,600	3,100
	East Palo Alto	Total	6,900	8,700	1,800
		PDA	820	1,600	780
	Foster City	Total	12,000	15,100	3,100
		PDA			
	Half Moon Bay	Total	4,100	4,600	500
		PDA			
	Hillsborough	Total	3,700	3,900	200
		PDA			
	Menlo Park	Total	12,300	17,700	5,400
		PDA	180	870	690
	Millbrae	Total	8,000	9,700	1,700
		PDA	590	2,100	1,510
	Pacifica	Total	14,000	14,500	500
		PDA			
	Portola Valley	Total	1,700	1,800	100
		PDA			
	Redwood City	Total	28,000	38,100	10,100
		PDA	650	8,500	7,850
	San Bruno	Total	14,700	17,900	3,200
		PDA	3,700	6,500	2,800
	San Carlos	Total	11,500	14,000	2,500
		PDA	40	110	70
	San Mateo	Total	38,200	50,800	12,600
		PDA	11,300	19,600	8,300
	San Mateo County Unincorporated	Total	21,000	22,800	1,800
		PDA	2,400	3,200	800
	South San Francisco	Total	20,900	25,300	4,400
		PDA	5,400	9,100	3,700
	Woodside	Total	2,000	2,100	100
		PDA			
	County Total	**Total**	**257,800**	**318,000**	**60,200**
		PDA	**43,800**	**80,000**	**36,200**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Santa Clara	Campbell	Total	16,200	18,800	2,600
		PDA	580	1,500	920
	Cupertino	Total	20,200	23,000	2,800
		PDA	2,200	3,400	1,200
	Gilroy	Total	14,200	19,600	5,400
		PDA	1,400	3,800	2,400
	Los Altos	Total	10,700	11,700	1,000
		PDA	9	40	31
	Los Altos Hills	Total	2,800	3,000	200
		PDA			
	Los Gatos	Total	12,400	13,000	600
		PDA			
	Milpitas	Total	19,200	30,400	11,200
		PDA	790	9,600	8,810
	Monte Sereno	Total	1,200	1,300	100
		PDA			
	Morgan Hill	Total	12,300	15,800	3,500
		PDA	260	1,300	1,040
	Mountain View	Total	32,000	58,300	26,300
		PDA	5,800	27,300	21,500
	Palo Alto	Total	26,500	32,900	6,400
		PDA	510	840	330
	San Jose	Total	301,400	448,300	146,900
		PDA	67,600	203,600	136,000
	Santa Clara	Total	43,000	57,000	14,000
		PDA	330	6,900	6,570
	Santa Clara County Unincorporated	Total	28,200	32,600	4,400
		PDA			
	Saratoga	Total	10,700	11,000	300
		PDA			
	Sunnyvale	Total	53,400	84,200	30,800
		PDA	6,300	35,800	29,500
	County Total	**Total**	**604,300**	**860,900**	**256,600**
		PDA	**85,700**	**294,200**	**208,500**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Solano	Benicia	Total	10,700	11,900	1,200
		PDA	620	1,300	680
	Dixon	Total	5,900	7,300	1,400
		PDA	450	600	150
	Fairfield	Total	34,500	40,200	5,700
		PDA	2,300	4,500	2,200
	Rio Vista	Total	3,500	6,300	2,800
		PDA			
	Solano County Unincorporated	Total	6,600	13,200	6,600
		PDA			
	Suisun City	Total	8,900	10,000	1,100
		PDA	1,100	1,900	800
	Vacaville	Total	31,100	33,600	2,500
		PDA	860	2,000	1,140
	Vallejo	Total	40,600	46,900	6,300
		PDA	390	1,600	1,210
	County Total	**Total**	**141,700**	**169,300**	**27,600**
		PDA	**5,700**	**11,800**	**6,100**

County	Jurisdiction	Summary Level	Households 2010	Households 2040	Growth in Households
Sonoma	Cloverdale	Total	3,200	4,900	1,700
		PDA	800	2,400	1,600
	Cotati	Total	3,000	4,100	1,100
		PDA	350	1,300	950
	Healdsburg	Total	4,400	4,600	200
		PDA			
	Petaluma	Total	21,700	24,500	2,800
		PDA	510	1,200	690
	Rohnert Park	Total	15,800	21,000	5,200
		PDA	1,300	5,100	3,800
	Santa Rosa	Total	63,600	80,000	16,400
		PDA	16,700	30,000	13,300
	Sebastopol	Total	3,300	3,800	500
		PDA	2,000	2,600	600
	Sonoma	Total	5,000	5,300	300
		PDA			
	Sonoma County Unincorporated	Total	57,000	60,000	3,000
		PDA			
	Windsor	Total	9,000	10,800	1,800
		PDA	1,100	2,300	1,200
	County Total	**Total**	**185,800**	**219,100**	**33,200**
		PDA	**22,900**	**44,800**	**22,000**

Regional Total	Summary Level	Households 2010	Households 2040	Growth in Households
	Total	2,608,000	3,426,700	818,700
	PDA	552,800	1,182,300	629,400

Employment Growth Forecasts

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Alameda	Alameda	Total	29,300	42,400	13,100
		PDA	6,900	16,900	10,000
	Alameda County Unincorporated	Total	29,000	29,900	900
		PDA	6,800	7,400	600
	Albany	Total	4,400	5,200	800
		PDA	2,200	2,200	0
	Berkeley	Total	90,400	121,700	31,300
		PDA	28,600	36,400	7,800
	Dublin	Total	18,100	31,100	13,000
		PDA	5,000	13,600	8,600
	Emeryville	Total	15,900	20,000	4,100
		PDA	13,500	14,700	1,200
	Fremont	Total	86,200	118,500	32,300
		PDA	38,100	56,500	18,400
	Hayward	Total	60,900	77,800	16,900
		PDA	7,600	8,500	900
	Livermore	Total	42,700	45,900	3,200
		PDA	24,000	23,700	-300
	Newark	Total	17,300	22,900	5,600
		PDA	390	420	30
	Oakland	Total	179,100	272,800	93,700
		PDA	158,200	241,200	83,000
	Piedmont	Total	1,800	1,900	100
		PDA			
	Pleasanton	Total	60,100	75,400	15,300
		PDA	12,600	23,300	10,700
	San Leandro	Total	49,700	59,600	9,900
		PDA	9,800	10,000	200
	Union City	Total	21,000	28,100	7,100
		PDA	270	230	-40
	County Total	**Total**	**705,700**	**953,100**	**247,400**
		PDA	**313,900**	**455,100**	**141,200**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Contra Costa	Antioch	Total	20,100	25,700	5,600
		PDA	2,000	2,700	700
	Brentwood	Total	11,600	12,000	400
		PDA			
	Clayton	Total	2,000	2,100	100
		PDA			
	Concord	Total	54,300	95,500	41,200
		PDA	10,400	40,300	29,900
	Contra Costa County Unincorporated	Total	35,600	40,900	5,300
		PDA	8,700	11,200	2,500
	Danville	Total	11,800	13,100	1,300
		PDA			
	El Cerrito	Total	5,300	5,900	600
		PDA	3,800	4,100	300
	Hercules	Total	5,000	5,400	400
		PDA	1,100	1,100	0
	Lafayette	Total	9,000	9,900	900
		PDA	6,500	7,500	1,000
	Martinez	Total	20,700	26,100	5,400
		PDA	6,800	9,400	2,600
	Moraga	Total	4,600	5,700	1,100
		PDA	1,400	1,600	200
	Oakley	Total	3,400	5,400	2,000
		PDA	1,600	3,100	1,500
	Orinda	Total	4,800	5,500	700
		PDA	2,700	3,100	400
	Pinole	Total	6,700	8,500	1,800
		PDA	5,200	6,200	1,000
	Pittsburg	Total	11,800	15,600	3,800
		PDA	5,100	6,700	1,600
	Pleasant Hill	Total	16,400	19,800	3,400
		PDA	6,400	7,600	1,200
	Richmond	Total	30,700	61,800	31,100
		PDA	13,400	35,300	21,900
	San Pablo	Total	7,400	9,100	1,700
		PDA	4,900	5,900	1,000
	San Ramon	Total	48,000	71,800	23,800
		PDA	25,500	44,900	19,400
	Walnut Creek	Total	50,900	58,100	7,200
		PDA	27,400	29,200	1,800
	County Total	**Total**	**360,100**	**497,900**	**137,800**
		PDA	**132,900**	**219,900**	**87,000**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Marin	Belvedere	Total	310	320	10
		PDA			
	Corte Madera	Total	6,500	7,200	700
		PDA			
	Fairfax	Total	1,600	1,700	100
		PDA			
	Larkspur	Total	7,500	7,700	200
		PDA			
	Marin County Unincorporated	Total	18,400	21,600	3,200
		PDA	660	740	80
	Mill Valley	Total	6,000	6,600	600
		PDA			
	Novato	Total	26,400	28,300	1,900
		PDA			
	Ross	Total	360	380	20
		PDA			
	San Anselmo	Total	3,300	3,400	100
		PDA			
	San Rafael	Total	43,400	49,000	5,600
		PDA	9,100	10,000	900
	Sausalito	Total	5,200	5,900	700
		PDA			
	Tiburon	Total	2,800	2,900	100
		PDA			
	County Total	**Total**	**121,800**	**135,000**	**13,200**
		PDA	**9,700**	**10,800**	**1,000**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Napa	American Canyon	Total	5,400	8,200	2,800
		PDA	1,300	1,600	300
	Calistoga	Total	2,200	2,400	200
		PDA			
	Napa	Total	33,900	42,900	9,000
		PDA	5,400	12,600	7,200
	Napa County Unincorporated	Total	20,700	21,100	400
		PDA			
	St. Helena	Total	5,700	6,000	300
		PDA			
	Yountville	Total	2,800	2,800	0
		PDA			
	County Total	**Total**	**70,700**	**83,400**	**12,700**
		PDA	**6,700**	**14,100**	**7,400**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
San Francisco	San Francisco	Total	576,800	872,500	295,700
		PDA	474,000	741,700	267,700

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
San Mateo	Atherton	Total	2,100	2,200	100
		PDA			
	Belmont	Total	7,900	9,400	1,500
		PDA	3,600	3,800	200
	Brisbane	Total	5,200	16,900	11,700
		PDA	560	9,500	8,940
	Burlingame	Total	28,000	42,600	14,600
		PDA	11,500	17,200	5,700
	Colma	Total	3,900	4,300	400
		PDA	1,500	2,000	500
	Daly City	Total	18,400	22,500	4,100
		PDA	4,600	4,800	200
	East Palo Alto	Total	5,100	6,700	1,600
		PDA	980	1,400	420
	Foster City	Total	15,800	27,200	11,400
		PDA			
	Half Moon Bay	Total	4,900	5,400	500
		PDA			
	Hillsborough	Total	2,100	2,300	200
		PDA			
	Menlo Park	Total	34,600	42,500	7,900
		PDA	6,200	11,400	5,200
	Millbrae	Total	5,900	11,600	5,700
		PDA	2,900	8,100	5,200
	Pacifica	Total	5,900	7,100	1,200
		PDA			
	Portola Valley	Total	1,500	1,500	0
		PDA			
	Redwood City	Total	59,300	86,700	27,400
		PDA	20,600	24,100	3,500
	San Bruno	Total	12,900	14,800	1,900
		PDA	9,300	10,300	1,000
	San Carlos	Total	16,300	19,100	2,800
		PDA	1,200	1,700	500
	San Mateo	Total	51,000	68,000	17,000
		PDA	25,400	32,900	7,500
	San Mateo County Unincorporated	Total	21,600	25,100	3,500
		PDA	3,300	3,300	0
	South San Francisco	Total	38,700	54,200	15,500
		PDA	8,300	9,100	800
	Woodside	Total	2,000	2,000	0
		PDA			
	County Total	**Total**	**343,300**	**472,100**	**128,700**
		PDA	**100,000**	**139,500**	**39,500**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Santa Clara	Campbell	Total	25,500	32,700	7,200
		PDA	5,200	6,600	1,400
	Cupertino	Total	26,800	38,000	11,200
		PDA	9,800	12,300	2,500
	Gilroy	Total	17,800	22,300	4,500
		PDA	4,600	4,800	200
	Los Altos	Total	14,100	17,200	3,100
		PDA	2,200	2,700	500
	Los Altos Hills	Total	1,600	1,700	100
		PDA			
	Los Gatos	Total	18,900	20,600	1,700
		PDA			
	Milpitas	Total	42,000	58,000	16,000
		PDA	5,600	9,900	4,300
	Monte Sereno	Total	530	560	30
		PDA			
	Morgan Hill	Total	19,300	19,600	300
		PDA	1,500	1,300	-200
	Mountain View	Total	48,500	73,300	24,800
		PDA	25,200	40,100	14,900
	Palo Alto	Total	101,900	126,500	24,600
		PDA	3,900	4,900	1,000
	San Jose	Total	387,500	554,900	167,400
		PDA	229,200	340,400	111,200
	Santa Clara	Total	102,900	170,600	67,700
		PDA	10,300	10,800	500
	Santa Clara County Unincorporated	Total	29,600	36,200	6,600
		PDA			
	Saratoga	Total	8,800	9,100	300
		PDA			
	Sunnyvale	Total	65,700	108,600	42,900
		PDA	21,800	33,100	11,300
	County Total	**Total**	**911,500**	**1,289,900**	**378,300**
		PDA	**319,300**	**466,800**	**147,400**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Solano	Benicia	Total	12,800	17,100	4,300
		PDA	9,200	12,900	3,700
	Dixon	Total	4,800	5,400	600
		PDA	280	340	60
	Fairfield	Total	43,200	50,000	6,800
		PDA	6,300	6,700	400
	Rio Vista	Total	2,400	2,500	100
		PDA			
	Solano County Unincorporated	Total	4,200	4,500	300
		PDA			
	Suisun City	Total	2,500	2,900	400
		PDA	1,100	1,000	-100
	Vacaville	Total	29,300	33,600	4,300
		PDA	5,000	4,600	-400
	Vallejo	Total	30,900	35,000	4,100
		PDA	2,600	2,800	200
	County Total	**Total**	**130,200**	**151,000**	**20,800**
		PDA	**24,600**	**28,300**	**3,700**

County	Jurisdiction	Summary Level	Employment 2010	Employment 2040	Growth in Employment
Sonoma	Cloverdale	Total	1,700	2,100	400
		PDA	590	630	40
	Cotati	Total	2,600	3,000	400
		PDA	690	570	-120
	Healdsburg	Total	8,300	9,000	700
		PDA			
	Petaluma	Total	30,000	39,800	9,800
		PDA	3,500	5,800	2,300
	Rohnert Park	Total	12,100	13,900	1,800
		PDA	5,100	4,900	-200
	Santa Rosa	Total	76,600	92,100	15,500
		PDA	41,200	45,900	4,700
	Sebastopol	Total	5,000	5,300	300
		PDA	4,600	4,800	200
	Sonoma	Total	7,100	8,000	900
		PDA			
	Sonoma County Unincorporated	Total	51,500	61,600	10,100
		PDA			
	Windsor	Total	7,700	8,900	1,200
		PDA	870	1,100	230
	County Total	**Total**	**202,700**	**243,600**	**40,900**
		PDA	**56,600**	**63,700**	**7,100**

Regional Total	Summary Level	Employment 2010	Employment 2040	Growth in Employment
	Total	3,422,800	4,698,400	1,275,500
	PDA	1,437,700	2,139,800	702,000