

# BayArea Plan

July 2013

Strategy for a  
Sustainable  
Region



Association of  
Bay Area  
Governments



Metropolitan  
Transportation  
Commission

Final Economic Impact  
Analysis for  
Future Regional Plans

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## 1.0 INTRODUCTION

*Plan Bay Area* is the region's first Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS) prepared by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). Due for adoption in summer 2013, *Plan Bay Area* specifies a detailed transportation investment and land use strategy through 2040. To initiate the process of developing a preferred scenario, ABAG developed five alternative land use scenarios that were paired with one of two alternative transportation investment scenarios developed by MTC.

Through an outreach process with stakeholders, ABAG and MTC selected 10 performance measures used to evaluate the outcomes of the five alternative scenarios that were considered in the development of *Plan Bay Area*. Those with the best performance were used to create a preferred scenario. While previous RTPs have emphasized the three Es of sustainability – Economy, Environment and Equity, based on input from business stakeholders, the performance measures assessment for *Plan Bay Area* more robustly considered economic performance than previous RTPs by adding “impact on Gross Regional Product (GRP)” as one of the 10 economic performance measures evaluated.

While this was one step to identify the impact of *Plan Bay Area* on the Bay Area economy, results of the GRP performance measures assessment did not yield significant differences among the five alternatives evaluated. MTC directed Cambridge Systematics, Inc. (CS) to develop an analytical report that recommends how MTC and ABAG could better evaluate economic impacts of the next iteration of *Plan Bay Area* in 2017. In this report, we make a clear distinction between measuring economic impacts versus promoting economic development. MTC and ABAG must balance the role of future Plans to foster economic development, environmental improvements, and equity. This paper is not intended to refine the recent approach and methods used to evaluate the five alternative scenarios or develop the preferred scenario. The goal here is to explain how a variety of measures could be used to evaluate how the land use patterns and transportation investment strategies contained in the next Plan might impact the regional economy. It is MTC's and ABAG's intent to use this initial review to foster further discussions with business stakeholders.

In the following subsections of this introduction, we first describe the GRP performance assessment method used for the current Plan and its limitations. We then describe the outreach process MTC and ABAG used to gather input from business stakeholders. Finally, we explain several measures that MTC and ABAG may apply in the next Plan cycle, providing brief summaries of five specific economic impact analyses recommended for consideration. Additional detail on each measure is included in the full *Economic Impact Analysis for Future Regional Plans* report.

## 1.1 ECONOMIC ANALYSIS OF *PLAN BAY AREA*

*Plan Bay Area* will specify how \$286 billion dollars should be spent in the Bay Area to improve transportation in the 25-year horizon of the plan. The plan will also identify a host of transportation and land use policies intended to leverage these investments and achieve a more sustainable land use pattern. During its extensive outreach process, MTC and ABAG worked with stakeholders to develop a set of 10 measures used to evaluate the performance of five scenarios (see *Plan Bay Area Performance Assessment Report*). The measure of economic impact used in that analysis is a forecast of Gross Regional Product (GRP) in 2035. GRP is the market value of all final goods and services produced in a given year within the nine Bay Area counties. GRP is one measure of the size of our economy. GRP includes wages and benefits, proprietor's income (which captures the output of the self-employed), and other property-type income that includes profits. Note that profits may be repatriated to a Bay Area firm's headquarters outside the nine counties.<sup>1</sup>

In addition to GRP, MTC and ABAG considered including other measures, such as employment by industry and median household income. Median household income is the amount which divides the Bay Area's households into two equal groups: one-half having income above that amount, and one-half having income below that amount. The median income is a better indicator of the distribution of wealth than average income because it is more sensitive to unusually high or low values. While these measures were reported, they were not formally included in the evaluation of the five scenarios or the preferred scenario.

The following brief summary will provide basic principles that should help the reader's understanding of the analytical methods we used in our economic analysis of *Plan Bay Area*, as well as those proposed for the next Plan.

### Effects from Transportation Investments

Our analysis of economic impacts from *Plan Bay Area* transportation investments starts with the reduction in business operating costs through lower congestion, accidents, and vehicle operating costs; the effects from expanding businesses' access to customer or supplier markets; and shortened commutes, thus, increasing the size and diversity of the labor pool from which businesses can recruit workers.

In a mature economy with high levels of congestion like the Bay Area, the vast majority of direct benefits from transportation improvements are from the reduction of business operating costs. When the region's businesses spend less on transportation per unit of output, they can compete against similar firms located outside the region and capture greater market share. As these local firms

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<sup>1</sup> Profits for the finance, insurance, and real estate (FIRE) industries, for example, constitute a significant share of their output.

increase their production, they hire more workers (i.e., direct employment and primary-income generation); and they buy more inputs, which causes their suppliers to hire more workers (indirect employment and secondary-income generation). In turn, these additional workers (direct plus indirect employment and income) consume products and services that require more workers (e.g., retail clerks, school teachers, etc.), which boost the region's output, income, and employment further (i.e., induced impacts).

## Effects from Land Use Policies

Changes in land use can generate economic benefits when businesses are concentrated closer together (i.e., agglomeration); and have closer access to a larger and more diverse pool of labor (i.e., labor market matching). Agglomeration impacts of land use policies are in addition to the direct travel savings derived from transportation investments. Agglomeration effects may be divided into five types. The first four of the five agglomeration effects involve business-to-business interactions that result from higher concentration of employment. *Plan Bay Area* policies concentrate employment into Priority Development Areas (PDAs) that increase the number and size of firms interacting in close proximity to one another. Empirical research indicates that employment density increases worker and firm interactions, which results in increased business productivity.<sup>2</sup> In particular, these agglomeration effects consist of:

- **Sharing benefits** are closely tied to economies of scale. Large pools of customers allow for economic activities that would otherwise be unprofitable. A simple example for a typical PDA would be an office supply store, which is poorly supported by a small number of businesses in a low-density office development, but becomes profitable in a high-density commercial development. These are called sharing benefits precisely because demand can be shared across a large number of companies or people.
- **Knowledge spillovers** occur as people interact. They share ideas and knowledge and collaborate to create new knowledge. Proximity is a key to knowledge diffusion, although it has emerged that proximity can be measured in ways other than spatial distance. With economic density, the potential for interactions increases and can improve the pace and breadth of learning and knowledge accumulation. This knowledge, over time, gets embodied in worker skills and production techniques to improve firms' productivity.
- **Competition** is a driving force in innovation. Industrial clustering can speed knowledge growth by forcing firms to innovate or fail. Clustering expands customers' access to the number of firms that directly compete with each other for their business. As the number of market participants increases, two things happen: 1) poor performers are more likely to be driven out of

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<sup>2</sup> Krugman, P. (1991). "Increasing Returns and Economic Geography," *Journal of Political Economy*, 99, 483-499.

business, and 2) remaining firms feel more pressured to innovate – to actively acquire knowledge. Both effects can lead to higher rates of innovation and productivity.

- **Matching benefits** are closely tied to economic specialization. They capture the fact that good economic fits facilitate productivity. The benefits of specialization arise from matching specialized products and services to specialized needs. Urban areas bring firms and industries near one another. As this pool of firms grows, odds increase that a firm needs a specialized input. For example, a manufacturer needing a specific metal alloy may be more likely to find it in a cluster of metal fabricators. The correct metal alloy may allow a manufacturer to eliminate a downstream production cost.
- **Access to labor** is a fifth agglomeration effect that involves the size and proximity, measured in distance or commute time, of jobs to housing. This effect is generated from both transportation investments that shorten commute times, and land use policies that locate higher density residential development nearer to job centers. A larger labor pool in closer proximity to employment opportunities increases the quality of employment-worker matches. As the pool of accessible labor grows, odds increase that firms will find a good fit for their specialized skill needs. Good matches lead to higher productivity because they are more efficient.

All of the growth in GRP and employment gains in *Plan Bay Area* represents benefits for the nine-county region as a whole as opposed to redistribution among the counties. In this analysis, CS measured the aggregate economic activity of all nine counties, and did not isolate the output of any single county. When *Plan Bay Area* investments and policies create more competitive conditions for the region, the resultant expansion of the Bay Area's economy comes at the expense of other regions, both domestic and foreign, where firms compete with Bay Area businesses for market share. Because the aggregate demand from all consumers globally is fixed, all economic growth is redistributive.

### **Limitations of the *Plan Bay Area* Economic Impact Analysis**

The methodology employed to measure the economic impacts of *Plan Bay Area* is designed to measure the difference between a "no-project" base case scenario and a set of alternative scenarios that vary in their level of investment and policies. *Plan Bay Area* did not include such a base case scenario, which meant that the final preferred scenario could not be measured relative to a base case or benchmark. Instead, the projected outcomes were presented as absolute forecasts of Gross Regional Product (GRP) growth. Such forecasts, especially over a 25-year period, are notoriously unreliable because regional, national, and global economies are buffeted by a multitude of significant and unpredictable market forces.

Furthermore, *Plan Bay Area's* \$286 billion dollars of regional transportation investments over 25 years amount to less than one-third of one percent of the Bay Area's annual GRP. This level of investment will have modest impacts at best, which are hard to measure in absolute terms, but can be isolated when measured



relative to a base case scenario. The impacts of the SCS land use policies, assuming they are fully implemented, also are modest since they are applied only to new development and redevelopment, which is a small fraction of the existing land use in a largely built-out region. The isolation of different outcomes between different scenarios (i.e., deltas) may be measured in absolute or percentage terms, and provide decision-makers and stakeholders with a more controlled evaluation of each alternative scenario performance while holding all other influences constant. Analyzing the performance of different scenarios relative to a base case provides a reasonable basis for comparison<sup>3</sup>.

## 1.2 BUSINESS STAKEHOLDER INVOLVEMENT

MTC and ABAG launched and maintained an active outreach effort throughout the *Plan Bay Area* process. This included inviting leaders and experts in the region's business community to participate in stakeholder meetings or soliciting their opinions individually. Through this effort, stakeholders requested that future updates to *Plan Bay Area* evaluate economic impacts in greater depth. To address this request, CS developed a draft scope of work for this project, proposing several economic impact measures to be evaluated for consideration in the next Plan. The draft workscope was discussed at a meeting with business stakeholders, as well as regional agency staff, including the following organizations:

- Bay Area Council;
- Bay Area Council Economic Institute;
- Silicon Valley Leadership Group;
- Bay Planning Coalition;
- Building Industry Association of the Bay Area;
- Contra Costa Council;
- East Bay Economic Development Alliance;
- Jobs and Housing Coalition;
- North Bay Leadership Council;
- San Mateo County Economic Development Corporation (SAMCEDA);
- Solano Economic Development Alliance;
- ABAG;

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<sup>3</sup> GRP analysis, along with analysis for the other nine *Plan Bay Area* performance measures, was also conducted for the alternatives included in the *Plan Bay Area* Draft Environmental Impact Report, which includes a "no project" alternative. A no project or base-case scenario provides a useful point of comparison when assessing the performance of multiple scenarios and is recommended for performance measure analyses in future Plans.

- Bay Area Air Quality Management District (BAAQMD);
- Bay Conservation and Development Commission (BCDC);
- MTC; and
- Joint Policy Committee (JPC).

### 1.3 TOPICS FOR ECONOMIC ANALYSIS IN THE NEXT *PLAN BAY AREA*

Discussion at the business stakeholder meeting focused on refining and vetting five topics that could measure an economic impact of the regional economy based on transportation investments and land use policies included in the next Plan as follows:

**State of Good Repair (SGR).** *Plan Bay Area* allocates about 88 percent of the \$277 billion to operations and maintenance of existing transit and roadway infrastructure. Yet despite this fix-it first policy, the Plan forecast shows distressed lane-miles of roadways will increase 51 percent over the next 25 years, compared to the target reduction of 63 percent. For transit, the forecast shows a 78-percent increase in assets past their useful life, compared to a target of 100-percent reduction. The direct consequences of a diminishing SGR include more wear and tear on vehicles from rougher roads; and in extreme cases, slower speeds. For transit, delays in vehicle and equipment replacements and refurbishments mean more unscheduled service outages, broken escalators, and noisy tracks. This section presents how the next update to *Plan Bay Area* could evaluate the economic impacts of this outcome versus that of alternative investment levels in SGR.

**Roadway Pricing.** This section presents a framework for measuring the regional economic effects of pricing on the Bay Area regional economy, and provides recommendations on how the next Plan can evaluate the economic effects of pricing strategies. In this section, we focus on roadway pricing that will be likely to reduce congestion. From an economic impacts perspective, reducing congestion has both positive and negative consequences. On one hand, tolls increase costs on businesses and households, which reduce spending on investment and consumption, and suppresses economic growth. On the other hand, less congestion provides faster and more reliable travel times, which improve productivity and reduce costs. Furthermore, correctly pricing a scarce resource (i.e., roadway capacity) leads to innovation and efficiencies that further boost economic competitiveness. This section presents analytical methods the next update to *Plan Bay Area* could apply to analyze the economic impacts of cordon pricing, congestion pricing of parking, more aggressive congestion pricing of bridge tolls, and other mechanisms.

**Goods Movement.** Nearly all industries, including professional services, rely on efficient movement of goods to support a cost-effective business

environment, and to maintain affordability and quality of life for residents. In addition, businesses providing goods movement services provide relatively high-wage jobs for the lower-skilled segment of the Bay Area's workforce. Thus, economic analysis of goods movement investments and policies provides credible measurement of the region's likely retention of lower-skilled, middle-income employment in the region. This section presents a framework and process for economic analysis that will enable MTC and ABAG to better estimate the impact of the RTP goods movement projects and SCS land use policies on Bay Area employment and output (i.e., GRP), and measure the cost effectiveness of these investments. The approach builds on MTC's 2004 and 2008 good movement studies, and will help MTC make the case for targeted transportation investments by better understanding their economic impact.

**Market Feasibility of PDAs.** This section describes how the next update to *Plan Bay Area* could determine the market feasibility of PDAs. While this topic is not strictly about economic impact analysis, business community stakeholders have raised concerns about the significant amount of residential and employment growth allocated to the region's PDAs in *Plan Bay Area* and whether the PDAs can accommodate this growth. Along with the support of implementation funding and other policy tools, *Plan Bay Area* assumes the market and community support will be sufficient to absorb significant increases in new development. As identified in the *Plan Bay Area* supplemental report - Priority Development Area (PDA) Development Feasibility & Readiness Assessment - analysis of a sample of PDAs indicates that regulatory or community constraints may prevent some of the assumed scale, mix, or density of development. For other PDAs, market demand for commercial space or market rate housing is not strong enough to bid up rents or home prices high enough for developers to proceed with a feasible project. The focus of this section is on the methods, data, and tools needed to measure the sufficiency of market demand required to drive PDA feasibility, including those identified in the PDA Development Feasibility & Readiness Assessment. These would be used to assess constraints that could prevent full-scale development where market demand is sufficient.

**Housing Policy.** In 2010, approximately 116,000 Bay Area workers commuted to their jobs from homes outside the nine-county region. *Plan Bay Area* forecasts that this number will increase to 155,000 in 2040, which is approximately 3.4 percent more workers than employed Bay Area residents. This continuing, but flat, jobs-housing imbalance compares favorably to the jobs-housing imbalance in the year 2000, when just more than 10 percent of the Bay Area jobs were filled by commuters living outside the region. Nevertheless, housing shortages impose steep economic penalties on the region. For some business stakeholder in the region, increasing the supply of housing is a high priority. This section describes how housing supply affects the economy and focuses in particular on the economic effects of locating housing closer to jobs. The section recommends applying a similar methodology used in *Plan Bay Area* to assess the economic impacts of policies

that increase the housing supply overall, and especially in closer proximity to jobs.

At the request of the business stakeholders, we have prepared a synopsis of the best practices of regional and state agencies across the nation that have applied economic impact analysis to evaluating the performance of their long-range transportation plans and project selection process. We present examples of successful analytical methods, engagement practices, and performance-based planning by metropolitan planning organizations (MPO), state departments of transportation (DOT), or economic development corporations. These practices all share the goal of better understanding the impact of transportation investments and land use policies on state or regional economic growth.

Each topic is presented in its own section in the report, and each section follows a similar format. This format divides the topic into four parts: 1) an overview that describes how the topic impacts the regional economy; 2) descriptions of the most feasible analytic methods and tools used to assess the economic impacts; 3) an assessment of MTC's or ABAG's readiness to conduct the preferred method of analysis, including access to sufficient data and analytic tools; and 4) an annotated bibliography that summarizes relevant studies. The state of good repair, roadway pricing, and goods movement sections focus on investments and policies embedded in the RTP component of then next *Plan Bay Area* update and are presented first. Following these topics, PDA feasibility and housing policy would be most affected by policies embedded in the SCS component of the next Plan.

MTC and ABAG intend to apply robust economic impact analysis in the next update of *Plan Bay Area*. Examples of best practices from around the U.S. described in the report primarily demonstrate approaches that link transportation and land use planning to regional economic development. Nevertheless, many of the case studies employ robust economic analysis methods, effective outreach to economic stakeholders, and state-of-the-art performance-based planning that integrate economic impacts with other measures. Aspects of these examples may be useful to incorporate into the next *Plan Bay Area* update.

## **1.4 RELATIONSHIP BETWEEN ECONOMIC IMPACT ANALYSIS FOR NEXT *PLAN BAY AREA* UPDATE AND OTHER BAY AREA STUDIES AND INITIATIVES**

The context for the economic impact analysis includes many studies and initiatives intended to better understand the benefits and tradeoffs between transportation investments (e.g., project prioritization, SGR versus expansion), land use policies, and new revenue measures. Each of these, however, has a unique set of stakeholders who have specific objectives. While some are seeking an objective of understanding economic impacts, many are aligned to foster economic development.

Given other recently completed or economic-related studies underway, CS has evaluated the relationship of other research and policy initiatives prepared by other agencies and private stakeholders that analyze or advocate for transportation investment and land use policy as a means of increasing the region's economic output and/or employment. In particular, two projects with a regional emphasis are highlighted below:

1. **Regional Prosperity Plan.** MTC and ABAG are currently undertaking a three-year initiative funded by a \$5 million grant from the U.S. Department of Housing and Urban Development, in conjunction with the U.S. Environmental Protection Agency and the U.S. Department of Transportation. The project will identify strategies to improve the region's economic prosperity by encouraging stronger, more sustainable communities, integrating housing and jobs planning, fostering local innovation in support of new jobs, and building a healthy regional economy for all. Over \$2 million in grants will be awarded to pilot projects to expand economic opportunities for low- and moderate-income workers and improve affordability near transit. The three-pronged planning effort includes an economic opportunity strategy, a housing the workforce initiative, and an equity collaborative that, together, will implement this program. These efforts are not likely to recommend analytical methods for evaluating economic impacts.
2. **JPC Regional Economic Development and Resilience.** The JPC coordinates the planning efforts of ABAG, the Bay Area Air Quality Management District, the Bay Conservation Development Commission, and MTC. One of the JPC's current projects focuses on regional economic development. Through this focus and prepared at the request of the JPC, the Bay Area Council's Economic Institute completed the *Regional Economic Assessment of the San Francisco Bay Area Economy*, which provides comprehensive analysis about what drives the regional economy in terms of competitiveness, growth and jobs. It also identifies barriers to growing a stronger regional economy with additional jobs in the future. It concludes by highlighting a number of areas for attention that, together, could be developed into a regional economic development strategy. The recommendations are well supported with data-driven, rigorous analytical methods, but the goal is focused on economic development and not economic impacts.

The Plan's 25-year horizon significantly exceeds the timeframes of these studies (by a factor of two to four). Nevertheless, the findings and recommendations put forth in these studies are likely to be useful in formulating alternative scenarios in the next *Plan Bay Area* update.

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