

# Bi-County Transportation Study

## Appendix D: Cost-Participation Framework Methodology

### Cost-Participation Framework, Tripmaking Proportion Calculation

The Bi-County team used two general approaches to calculate the tripmaking proportion to inform the cost-participation framework for the priority projects, which are estimated to cost \$480 million in total. This appendix describes the alternative methods considered for the framework and the resulting trip shares.

#### *Overall trip approach*

Consistent with San Francisco's movement towards an automobile trip mitigation fee (ATMF), this approach looks at the impact of the developments on the transportation network in terms of the number of new daily trips the developments are placing on the network.

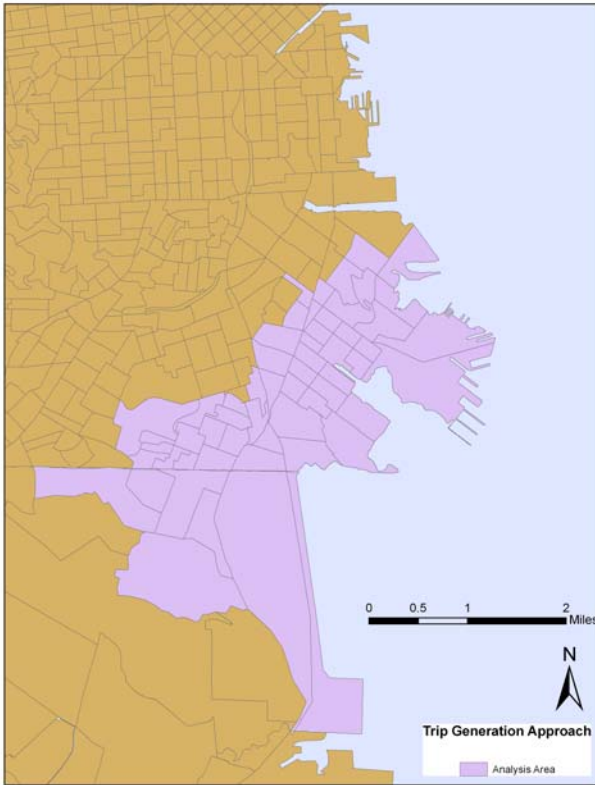
For the purposes of this analysis, the study area was defined as all Traffic Analysis Zones (TAZs) within 0.75 miles of the developments. This distance was chosen because the Bi-County model, a modified version of the Authority's SF-CHAMP travel demand model, demonstrated that a high proportion of the trips that use the Tier 1 infrastructure projects have origins or destinations in these TAZs. If any portion of a TAZ was within 0.75 miles of a development, then all the trips within that TAZ were counted (See Figure 1).

Calculating the public and private shares of new trips entailed comparing overall trips for several model scenarios. In order to calculate the public sector share of the impact, the team used Bi-County model forecasts to determine the increase in tripmaking from 2005, the base year, to the 2030B scenario, which assumes general background growth to 2030 excluding the Bi-County developments. In order to determine the private sector share, the team used the growth in tripmaking from the 2030B scenario to a 2030LU scenario, which includes both background growth and the proposed development projects. Because the shares are based only on future new trips, the number of trips in the 2005 base year was excluded from the calculation of proportional trip shares. In order to isolate the tripmaking attributed to development, these future year model scenarios included only the transportation network defined in the Regional Transportation Plan, without the additional of the Bi-County transportation projects.

Within this approach, the team considered several possible variants, including shares based on all trips, all auto trips, and all external trips. The first approach is the most straightforward: it would base shares on all trips generated by each TAZ, including all modes as well as internal trips within a development. Any trip with at least one trip end in a TAZ representing a Bi-County development was allocated to that development, while trips between two study area developments were split evenly between them. The variant based on auto trips generated is methodologically similar but excludes non-auto trips, focusing on the mode with the greatest impacts but not accounting for costs associated with increases in other trips. The variant based on external trips generated would base shares only on trips that include one end outside a development's TAZ in order to more directly account for trips that would use infrastructure outside each development.

For each approach, the team calculated the percentages of new trips contributed by each county's background growth and each new development. Table 1 shows total trip generation associated with each development and related county. Table 3 compares the resulting trip contribution percentages for all methods explored.

**Figure 1: Analysis Area for Overall Trip Approach**



**Table 1: Total Daily Trip Generation in Bi-County Study Area**

Stakeholder	Trips	Percentage
<i>Public Share (2005 – 2030B)</i>	<i>136,800</i>	<i>30.3%</i>
SF Background	87,800	19.5%
Brisbane Background	38,300	8.5%
EDC Background	10,700	2.4%
<i>Private Share (2030B – 2030LU)</i>	<i>314,300</i>	<i>69.7%</i>
India Basin	23,100	5.1%
Hunters Point Shipyard	48,900	10.8%
Candlestick Point	92,900	20.6%
Executive Park	18,900	4.2%
Visitacion Valley	16,200	3.6%
Baylands	82,500	18.3%
Cow Palace/East Daly City	31,700	7.0%
<b>Total</b>	<b>451,100</b>	<b>100%</b>

*By-project approach*

The second way the bi-county team approached the cost-participation calculation was by determining how many daily trips from each project used each Tier 1 facility. With this method, the cost of each project was divided into shares based on the number of trips attributed to each development, and then these cost shares were added together to determine total contribution shares. The basis for the analysis is the 2030 w/Everything model scenario, which includes all of the development projects as well as the Bi-County transportation projects. Unlike the overall trip approach, this method is not based on the change in trips from 2005 to 2030 because the facilities do not currently exist; rather, the analysis considers only trips in the future year.

To perform this analysis, the team used a select-link analysis from the Bi-County model for each project which, for any selected transportation network link, indicates the number of trips using that link originating from every TAZ. Trips between development zones were split between the two development zones. Any trip with an origin or destination in a development TAZ and its other trip end outside of the development zones was attributed to that development. If the trip was entirely outside of development TAZs, but within San Francisco or San Mateo, that trip was attributed to that county. If the trip was between San Francisco and San Mateo, but outside development zones, it was split between the two counties. If the trip began or ended in San Francisco or San Mateo, and had its other end outside of both counties, then the trip was attributed entirely to that county. Trips that had origins and destinations outside of San Francisco and San Mateo were subtracted out of the analysis. Table 2 below displays the results for applying this method for each Priority Project. Table 3 compares the resulting trip contribution percentages for all approaches.

**Table 2: Cost Participation by Use of Tier 1 Projects by Development/County in 2030 w/Everything Scenario**

	Geneva/US 101 IC	Geneva Avenue Ext	Harney/ Geneva BRT	Bayshore Station	T-Third Segment S Ext	Portion of Total Cost
<i>Public</i>	38%	43%	45%	53%	50%	43%
San Fran	20%	16%	37%	26%	34%	28%
San Mateo	18%	26%	9%	27%	16%	15%
<i>Private</i>	68%	57%	55%	47%	50%	57%
Hunters Point	0%	0%	8%	1%	0%	3%
Candlestick	25%	6%	24%	8%	7%	20%
Exec Park	7%	1%	4%	1%	2%	5%
Vis Valley	2%	2%	2%	3%	0%	2%
Baylands	23%	38%	13%	32%	39%	22%
East Daly City/ Cow Palace	5%	10%	3%	2%	1%	5%

*Threshold argument:* For both approaches, there is an additional variant using a ‘threshold argument’, which posits that, due to the amount of land development growth in a relatively concentrated amount of time, and the significant use of the Tier 1 facilities, without these land developments, none of the Tier 1 transportation infrastructure would be necessary nor implemented. Even the T-Third extension, which has already been approved for funding from the Federal Transit Administration, was conceived in consideration of private developer proposals, and the project has not been implemented, in part, to maximize the benefits based on full build out of the land developments. Under this argument, the funding of all Tier 1 projects is the sole responsibility of the private developments.

Table 3 below compares the results of applying all the above methods in terms of cost participation for each Bi-County partner.

**Table 3: Comparison of Methods for Calculating Total Cost-Participation Amounts (\$Million)**

	Method A – Trip Generation				Method B - Usage	
	Total Trips	Auto Trips	External Trips	Threshold (Auto Trips Gen)	By-Project	Threshold (By-Project)
<i>Public</i>	32%	33%	38%	0%	43%	0%
SF Background	20%	19%	24%	0%	28%	0%
SM Background	12%	14%	14%	0%	15%	0%
<i>Private</i>	68%	67%	62%	100%	57%	100%
Hunters Point	11%	11%	12%	16%	3%	6%
Candlestick	22%	22%	20%	33%	20%	37%
Exec Park	4%	4%	3%	6%	5%	8%
Vis Valley	4%	3%	3%	5%	2%	3%
Baylands	19%	18%	17%	27%	22%	38%
East Daly City/ Cow Palace	7%	8%	6%	12%	5%	7%