

# **An Innovative Performance Based Approach to the Health Impacts of Transit Investments**



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# PI BayArea Plan

Building on a Legacy of Leadership

**Links land use and housing to transportation**

**Region must show how it can house all the population in the next 30 years**

**Preservation of open space and agricultural land**

**Show how development pattern and transportation network can reduce greenhouse gases**

**Plan Bay Area to achieve a**

**15%**

**CO<sub>2</sub> reduction per capita by  
2035**

An aerial photograph of a suburban residential development. The layout is characterized by a central circular road that branches out into several concentric circular roads, creating a circular neighborhood design. The houses are densely packed, and the roofs are mostly grey. There are some green spaces and trees scattered throughout the development. The text is overlaid in the center of the image.

**House 100% of  
growth without  
displacing low  
income residents  
by 2035**

**700**  
**Projects**  
**analyzed**

# BENEFITS & COSTS

## PERSONAL CHOICE

Travel  
Time



Vehicle  
Operating Costs



Health  
Costs



## EXTERNALITIES



CO<sub>2</sub>/PM  
ROG/NOX



Fatal and Injury  
Collisions

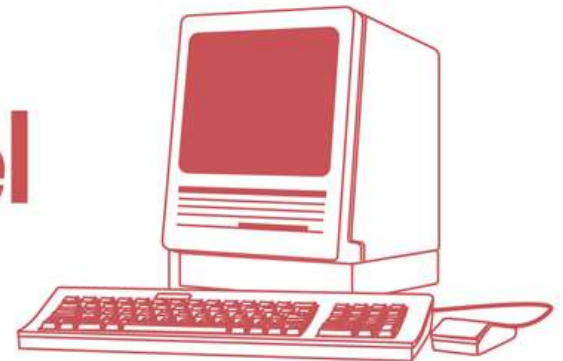


Noise

**100** Projects with benefit/cost analysis



**Activity-Based Travel Model**



# Active Transportation Target Development

Where does walking and cycling fit within the 30 min/day of moderate to vigorous activity?

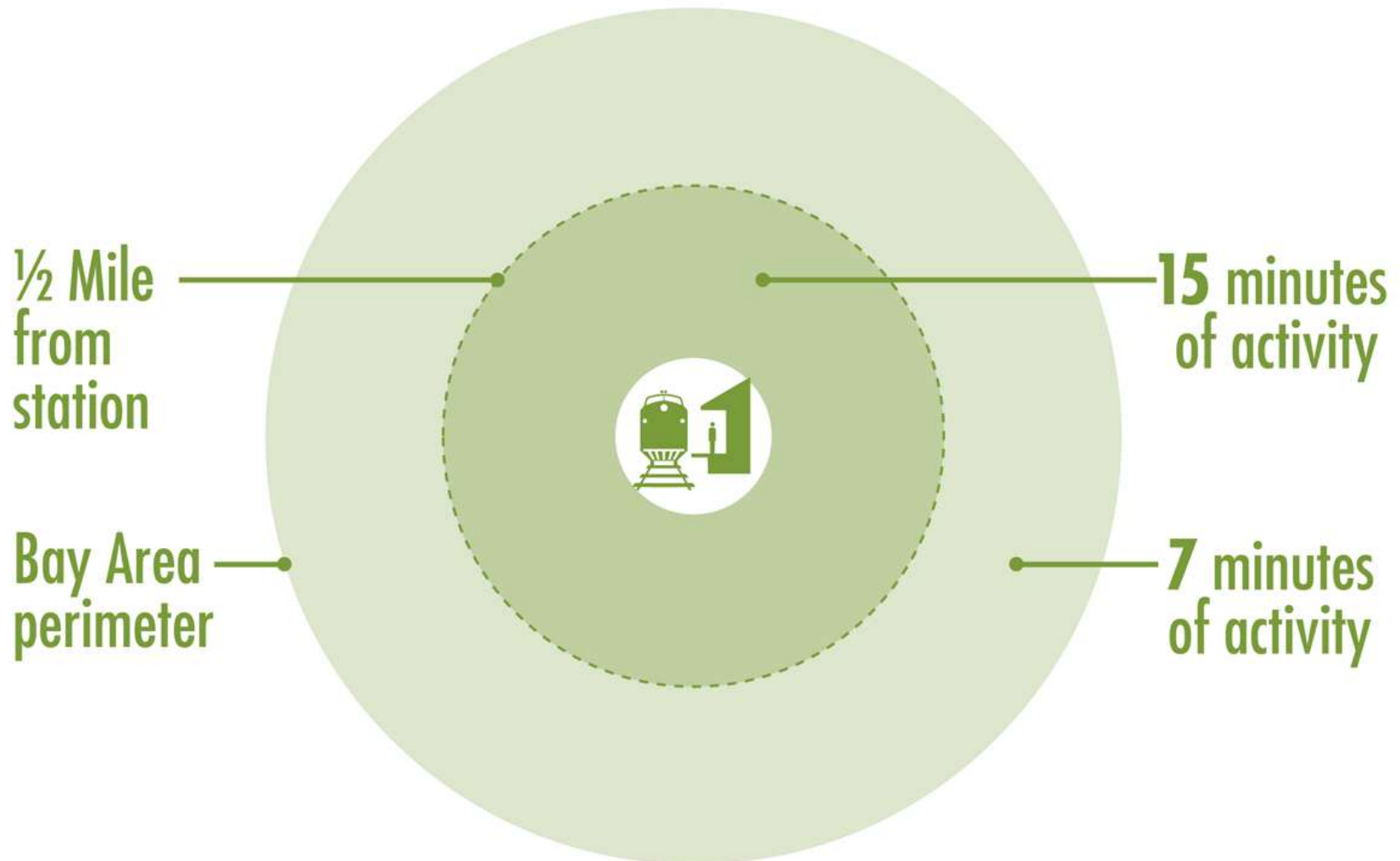
**No metrics for active transportation**

No performance standards from the CDC Community Guide – insufficient evidence that transportation policies increase physical activity

What is the expected increase in active transportation in 30 years?



# How much physical activity should transportation take credit for?



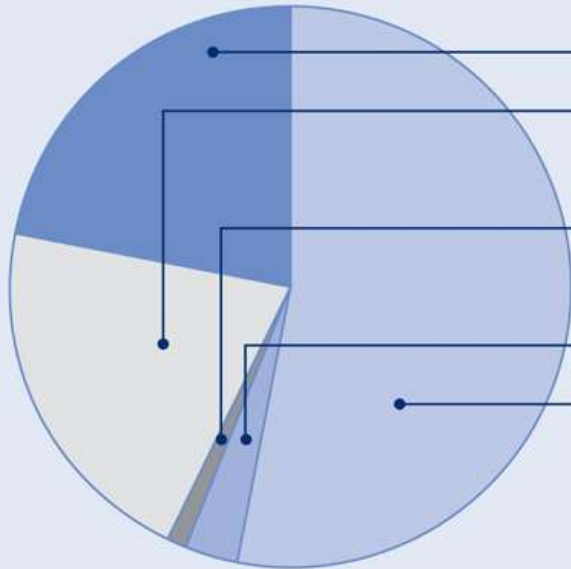
# Methodology of Evaluating Active Transportation

**% of Active Individuals**

$$\frac{(\text{Change in minutes/person/day}) * (\text{inactive population } 62\%)}{(\text{Minutes to become active } -30)}$$

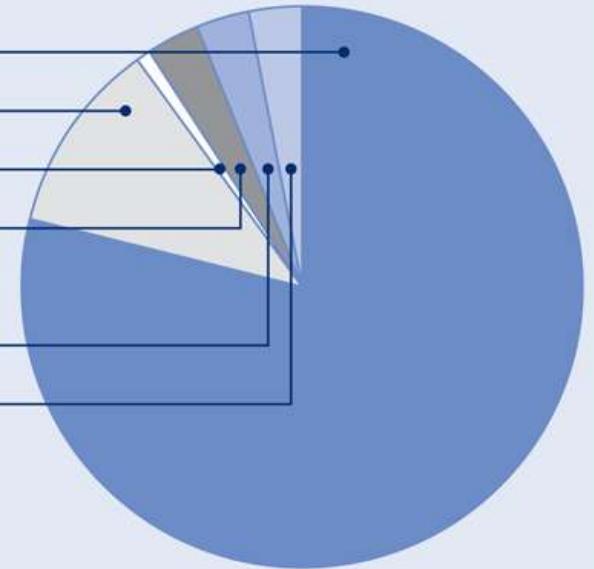
**Active individuals from the project**

$$\frac{\text{Percent of active or inactive individuals}}{\text{Projected Bay Area Population}}$$



**Regional Bicycle Network**

22%	Travel Time	79%
21%	Auto Travel Costs	11%
0%	PM	1%
1%	CO2	3%
0%	Other Pollutants	0%
3%	Collisions	3%
53%	Active Transportation	3%
0%	Noise	0%



**Summary of Total Benefits**

**62%**

**Bay Area Inactive**

California Health Interview Survey

< 30 minutes  
of activity

**\$717**

**Savings From Lost Productivity**

Per person

**\$326**

**Health Care Cost Savings** Per person

(Disease types attributable to physical inactivity)

# What happens when everyone meets the 15 minutes per person per day target?

**\$1.1 Billion**

Lost productivity and health care cost savings

**10.6%** Become active



**\$3.2 Billion**

Saved based on the Value of Statistical Life (VSL)

**650 LIVES SAVED**



# Change in Most Active Individuals per Project Cost

Rank	Project Name/Description	Project Type	Total Annualized 2035 Costs (millions)	B/C Ratio	Active Individuals	Active Individuals/Million
1	BART Metro Program (including Bay Fair Connection and Civic Center Turnback)	Transit Efficiency	N/A	>60	2735	>2,338
2	San Francisco Congestion Pricing Pilot	Pricing	\$5.1	45	11899	2338
3	Treasure Island Congestion Pricing	Pricing	\$1.2	59	2483	2108
4	Regional Bikeway	Bicycle/ Pedestrian	\$73.2	2	54406	743
5	Transportation for Livable Communities	Livability	\$254.7	3	167639	658
6	Irvington BART	Transit Efficiency	\$1.5	12	763	496
7	SR-29 HOV Lanes and BRT (Napa Junction to Vallejo)	Road Efficiency	\$4.2	3	976	231
8	San Mateo Countywide Shuttle Service Frequency Improvements	Transit Efficiency	\$6.3	2	1321	211
9	BART to San Jose/Santa Clara (Phase 2: Berryessa to Santa Clara)	Transit Expansion	\$69.9	5	12117	173
10	Caltrain Service Frequency Improvements (6-Train Service during Peak Hours) + Electrification (SF to Tamien)	Transit Efficiency	\$33.9	5	5760	170

# Change in Least Active Individuals per Project Cost

Rank	Project Name/Description	Project Type	Total Annualized 2035 Costs (millions)	B/C Ratio	Active Individuals	Active Individuals/Million
1	SFMTA Transit Effectiveness	Transit Efficiency	\$7.8	11.4	(3811)	(486)
2	I-80 Auxiliary Lanes (Airbase Parkway to I-680)	Road Efficiency	\$3.5	5	(399)	(112)
3	Alameda-Oakland BRT + Transit Access	Transit Efficiency	\$2.1	6	(200)	(96)
4	Bay Bridge Contraflow	Road Efficiency	\$30.5	2	(2591)	(85)
5	Silicon Valley Express Lanes	Express Lanes Network	\$69.9	6	(5430)	(78)
6	Muni Service Frequency	Transit Efficiency	\$14.0	2	(1058)	(76)
7	AC Transit Service Frequency Improvements (Restoration of 2009 Funding Levels)	Transit Efficiency	\$64.9	2	(4761)	(73)
8	Fremont/Union City East-West	Arterial Expansion	\$10.0	7	(449)	(45)
9	CTC Application + Alameda County Authorized Lanes Express Lanes Network	Express Lanes Network	\$118.2	5	(5050)	(43)
10	Better Market Street	Transit Efficiency	\$10.0	6	(423)	(42)

Transit projects that  
compete with bicycle  
trips can make people  
less active



Transit projects that  
have travel time  
savings make people  
more active

Integrated  
Transportation  
Health Impact  
Model (ITHIM)

WHO Health  
Economic  
Assessment Tool  
(HEAT)





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