PACIFIC RESEARCH INSTITUTE

EVALUATION OF *PLAN BAY AREA*

By Wendell Cox

MAYOR'S TRANSPORTATION TASK FORCE REPORT: 2030

Review of the Mayor's Transportation Task Force Report: 2030
Supplement to: Plan Bay Area Evaluation[1]
City of San Francisco

September 2014

1. Introduction

San Francisco Mayor Ed Lee's Transportation Task Force published its 2030 Transportation Plan in November.[2] The plan outlines funding and revenue needs for the San Francisco Municipal Transportation Agency through 2030. The plan anticipates spending more than $10.1 billion by 2030 on transit, streets, pedestrian, and cycling facilities as well as planning, safety, and security measures to support the system. This report provides a summary evaluation of the 2030 transportation plan.

Approximately 71 percent of the 2030 plan funding would be spent on transit, 15 percent on streets, 10 percent on pedestrian and cycling facilities, and the balance of 4 percent on transportation safety, security, and planning (Figure 1). The city has identified approximately $3.8 billion in available funding for the plan. This leaves a deficit of approximately $6.3 billion.

Transit accounts for the largest share of the unfunded deficit, at $4.2 billion. The highway and pedestrian and cycling facilities have a deficit of $900 million each. The safety, security, and planning elements have a deficit of $300 million (Figure 2).

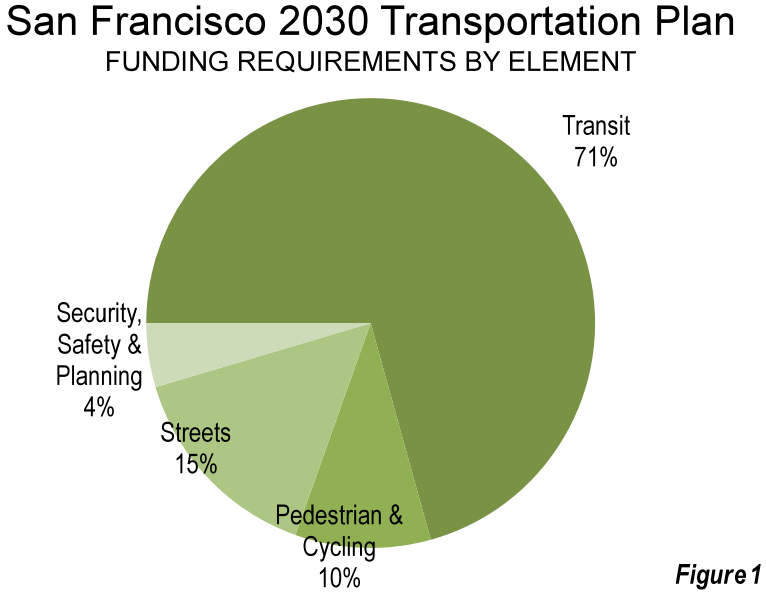

Figure 1

[1] Wendell Cox, Evaluation of Plan Bay Area, Pacific Research Institute, June 2013.
[2] http://www.sf-planning.org/ftp/files/publications_reports/transportation_taskforce/Taskforce_AnnualReport2030V9_1113.pdf

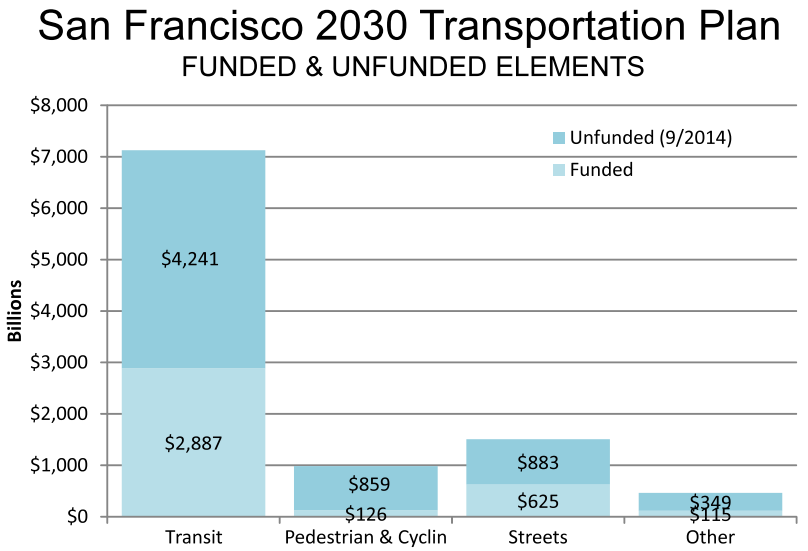

Figure 2

The Mayor's Transportation Task Force identified a funding program that would raise approximately $3 billion of the deficit. This includes:

- A ballot proposition for $500 million in bonds that has been placed on the November 2014 ballot (Proposition A).[3]
- A later $500 million bond issue that is intended for 2024.
- A sales-tax increase of 0.5 percent that the Task Force indicated would be available after the 2016 election.
- An increase in the vehicle licensing fee to 2 percent. The Task Force recommended placing this on the ballot in 2014. However, Mayor Lee withdrew his support of that scheduling and it is likely that the vehicle licensing fee will be on the 2016 ballot.

At the same time, the San Francisco Board of Supervisors has filed a ballot measure that guarantees an annual increase in funding based on the percentage increase of the city's daytime or night-time population, whichever is greater.[4] According to the press, this measure was proposed by Supervisor Scott Wiener in response to the failure to place the vehicle licensing fee on the 2014 ballot. If approved, this measure could be cancelled by the mayor upon voter approval of a vehicle licensing fee increase (presumably in the 2016 election).

[3] http://sfgov2.org/ftp/uploadedfiles/elections/candidates/Nov2014/Nov2014_TransportRoadImprovement.pdf
[4] http://sfgov2.org/ftp/uploadedfiles/elections/candidates/Nov2014/Nov2014_PopulationBasedAdjustment.pdf

Even if all of the new funding sources are approved by the voters, there will still be a deficit of $3.4 billion that must be raised to accomplish the plan's goals by 2030. The Task Force principally recommended continuing efforts to obtain additional funding from other sources, especially the state and federal governments.

2. Population in San Francisco

The 2030 transportation plan projects that San Francisco's population will reach nearly 1,000,000 residents by 2040 (from the present 837,000). An Association of Bay Area Governments projects an even larger figure, at 1,086,000 in 2040.

In contrast, the State Department of Finance, which publishes the official population projections for the state, county, and cities, projects a population of 891,000 by 2040.[5]

These population increases would be unprecedented for a large high-income municipality that is fully developed. This is illustrated by an analysis of 71 high-income core cities that were fully developed in 1950 and have not materially changed their borders. Only one that had reached a population peak of 400,000 grew into the early 2000s (Vancouver).[6] This illustrates the difficulty developed areas face in substantial intensification.

Since that time, a few have recovered to their population peaks, including San Francisco, Tokyo,[7] and Stockholm. Stockholm now exceeds its peak population by 11 percent, San Francisco by eight percent, and Tokyo by one percent.

By contrast, to reach a population of 1 to 1.1 million by 2040 would require an increase of between 30 percent and 40 percent from the 1950 peak. It seems unlikely that the city of San Francisco will reach 1 million residents by 2040, much less 1,086,000.

3. Transportation in San Francisco

Most transit travel in San Francisco is by the San Francisco Municipal Railway (Muni), which is one of the largest transit systems in the United States. It is administered by the San Francisco Municipal Transportation Agency. The city of San Francisco charter has had a "transit first" policy since 1973, which involves giving priority to transit, cycling, and walking over private vehicles.[8]

Despite the "transit first" policy, the share of work trips by transit, cycling, and walking has fallen since 1980.[9] In 1980, 51.4 percent of commuting by city residents was by the "transit first" modes of travel (transit, cycling, and walking). In 1990, 38.2 percent of resident work trips were by transit. By 2012, the transit work trip market share had fallen to 33.1 percent. Other modes (including cycling) had an increase, from 2.3 percent to 6.3 percent, while walking declined from 10.9 percent to 9.8 percent. At the same time, single-occupant vehicle commuting increased from 33.8 percent to 36.3 percent and car-pool

[5] http://www.dof.ca.gov/research/demographic/reports/projections/p-1/
[6] Wendell Cox, "International Shrinking Cities," *Shrinking Cities,* in Harry W. Richardson and Chang Woon Nam, editors, Routledge, 2014, p. 19-23. http://www.amazon.com/Shrinking-Cities-Global-Perspective-Regions/dp/0415643961.
[7] The 23 ku area, which is normally considered the core city of the Tokyo-Yokohama metropolitan area. This is the land area of the Tokyo municipality that was abolished in the 1940s (there is no Tokyo municipality).
[8] https://www.sfmta.com/sites/default/files/pdfs/SF%20Charter%20-%20Article%208A%20-%20MTA.pdf
[9] The first year for which such data is available following adoption of the "Transit First" charter provision. Comparable 1970 data is not available.

commuting dropped from 12.5 percent to 7.7 percent of residents. The largest increase was in working at home (2.2 percent to 6.7 percent). Overall, shared work access methods (transit and carpooling) declined 9.9 percentage points, while individualized work access modes (driving alone, working at home, "other," and walking) rose 9.9 percentage points (Figure 3).

Since 1980 there has been fluctuation in work trip travel by modes, with driving alone reaching a peak in 2000 and transit reaching a nadir. Some of the decline in driving alone since 2000 may be the result of much higher gasoline prices. Yet, even with transit increases, by 2012, its work trip market share remained below that of 1980, while driving alone represented a larger share of work trips than in 1980.

Market share figures mask the growth in driving alone because the number of resident employees in the city has grown. In 2012, the total driving alone work trips were 43 percent above the 1980 figure, an increase of nearly 50,000 daily round trips. It may be useful for the city to closely examine the factors that are responsible for the continuing increase in automobile usage.

Transit work trips were up 15 percent from 1980, or 20,000 daily round trips. The largest increase in work access modes other than driving alone was in working at home, which was 23,000 higher in 2012 than in 1980.

The Task Force Report indicates an objective of increasing the percentage of non-automobile travel 28 percent by 2018 (from 39 to 50 percent of trips).[10] By comparison, from 2000 to 2012, the increase in non-automobile work trips was only 14 percent, and at a level virtually the same as in 1980. It could be a daunting challenge to reach the 2018 objective.

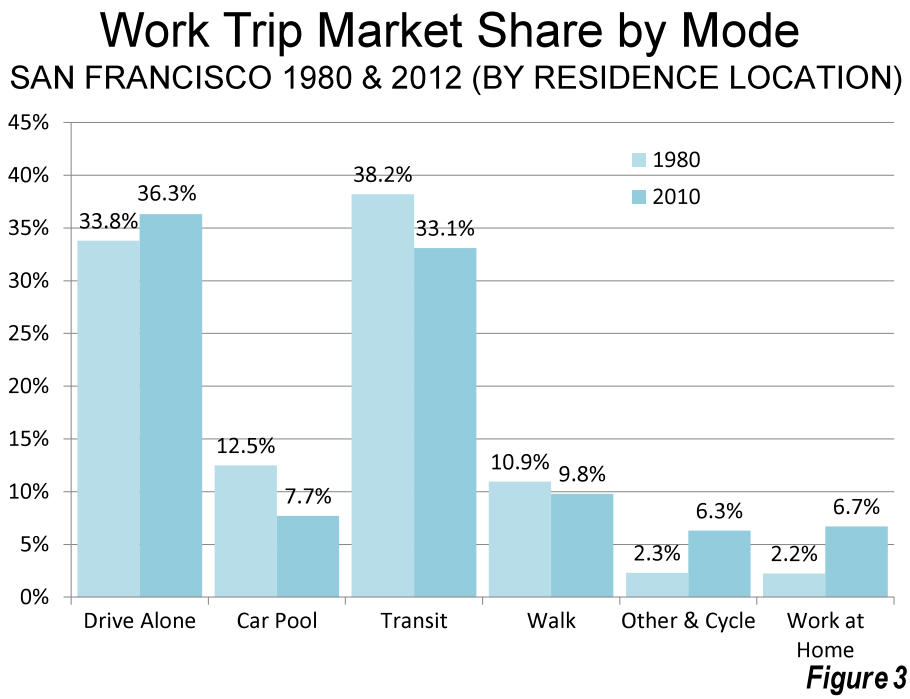

Figure 3

Planning for the larger population may have resulted in a 2030 plan that is more costly than would be required for a more plausible, smaller 2040 population.

[10] http://www.sf-planning.org/ftp/files/publications_reports/transportation_taskforce/Taskforce_AnnualReport2030V9_1113.pdf, p. 28.

4. The 2030 Transportation Plan

The major elements of the 2030 transportation plan are described below.

4.1 Transit

San Francisco is a particularly favorable environment for transit. This is indicated by high ridership levels compared to other counties around the nation. Approximately 32 percent of resident workers in San Francisco use transit for their work trips. San Francisco's transit work trip market share ranks 7th among the nation's 3,143 counties. Higher transit percentages occur only in the four more urbanized New York City counties (the boroughs of Brooklyn, Manhattan, the Bronx and Queens), Hudson County, New Jersey (directly across the Hudson River from Manhattan[11]) and the District of Columbia (in order).[12]

Further, San Francisco constitutes the overwhelming majority of transit commuting in the Bay Area, despite its having only 10 percent of the population.[13] In 2010, approximately 63 percent of transit commutes ended in the city.

Two thirds of transit commutes in the Bay Area end in downtown San Francisco, which is the nation's 4th largest central business district (following New York, Chicago and Washington).[14] Approximately 50 percent of people working in downtown San Francisco use transit to get to work. Yet, only 8 percent of Bay Area employment is in the central business district. Transit is far less of a factor outside the city of San Francisco, where only 4.2 percent of commutes are by transit, a figure below the national average of approximately five percent.[15]

At the same time, riding transit in San Francisco can be a less than pleasant experience. As the Task Force Report indicates, many transit routes are overcrowded. Further, there are serious problems with reliability of service, which is the result of maintenance issues (See "Muni Challenges," below).

The transit components of the 2030 plan would seek to improve the reliability of transit service, to reduce travel times, and to provide additional services.

The major transit elements of the 2030 transportation plan are:

- Market Street improvements: Improvements would be made to Market Street to improve the operation of "transit first modes," which include transit, cycling and walking.

- Caltrain: The city has an obligation to pay its share of Caltrain commuter rail costs (along with San Mateo County and Santa Clara County). The 2030 plan requires additional funding for Caltrain capital maintenance and the Caltrain electrification project. In addition, the 2030 transportation plan includes $450 million for the expansion of the Caltrain line from the present Fourth and Townsend station to the Trans-Bay Terminal.

[11] Hudson County has a new, large business district on the Hudson River waterfront and is linked to Manhattan's business district (the second largest in the world) by both rail rapid transit and ferry service.
[12] American Community Survey, 2010 (5 Year)
[13] Combined statistical area.
[14] Census data and http://www.demographia.com/db-cbd2000.pdf
[15] Calculated from American Community Survey for the combined statistical area.

- Geary Avenue rapid busway: Improvements would be made to the bus service along Geary Avenue, which is one of the most heavily traveled bus corridors in the United States. A rapid busway would be created by designating lanes for bus-only operation, which would lead to faster and more reliable service.

- Bus fleet replacement: All of the transit buses would be replaced, at a cost of $2.7 billion by 2030.

- Larger buses: $42 million would be made available to purchase larger 60-foot buses to be used on routes where more frequent service is impractical. These buses would replace the smaller, generally 40-foot buses currently in operation.

- Expansion of fleet: Additional buses would be purchased to enable the service expansions that are anticipated under the Transit Effectiveness Project, which is described below.

- Transit Effectiveness Program: Under the Transit Effectiveness Program, Muni bus services would be restructured to provide higher levels of service on the most heavily patronized routes and lower levels of service on the routes with limited traffic. In addition, there would be an approximately 10 percent increase in transit service citywide. The Transit Effectiveness Program would also include improvements to streets and transit priority traffic signaling to improve the reliability of bus services.

- Additional transit improvements would also include renovation of facilities, and the placement of canopies at BART/Muni Metro stations on Market Street.

Transit: The Need: From the perspective of transit passengers, the most important elements of the 2030 transportation plan are those that expand service and improve the reliability of service. These are the elements relating to the bus fleet and the Transit Effectiveness Project. Nearly $800 million is anticipated to be committed to these projects from the proposed two bond issues and the vehicle licensing fee increase.

Muni Challenges: There is some question as to the ability of the city to deliver on its transit service promises, even if it should receive all of the proposed funding. The Task Force Report attributes the source of Muni reliability problems to maintenance issues:[16]

In a commercial environment, maintenance of assets would have been funded out of ongoing revenues (failure to do so might result in organizational failure). For example, the shortfall in bus replacement funding, the renewal of fixed guideway infrastructure, and the renewal and expansion of MTA facilities might have been expected to be funded from ongoing fares, advertising, and subsidy revenues.

The Task Force Report describes the problem as follows:

> Muni vehicle life span drastically reduced: Muni's fleet is aging and deteriorating as a result of underinvestment in routine maintenance. During years of constrained budgets, SFMTA deferred maintenance in order to provide scheduled daily transit service. As a result, Muni's vehicles have not received mid-life rehabilitations or replacement, resulting in a fleet that has high service unreliability and frequent and expensive emergency repairs. If Muni had prioritized available

[16] http://www.sf-planning.org/ftp/files/publications_reports/transportation_taskforce/Taskforce_AnnualReport2030V9_1113.pdf

resources towards maintenance, rehabilitation, and replacement over the past 20 years, there would be fewer and less significant in-service vehicle breakdowns.

However, an examination of Muni operating costs over the last 15 years for which data is available does not indicate constrained budgets. According to Federal Transit Administration National Transit Database reports, Muni's gross operating costs rose 61 percent from 1997 to 2012, *after* adjustment for inflation. By comparison, Muni's ridership (measured in passenger miles) rose only 10 percent. This indicates an increase in cost per passenger mile of 44 percent, inflation adjusted (Figure 4).[17]

Muni's total passenger trips (boardings or unlinked trips) rose only 2 percent, even less than the passenger mile increase and well below the population increase (12 percent). Thus, Muni's operating expenses have risen far more quickly than its passenger loads. If costs had been kept within inflation between 1997 and 2012, Muni would have spent approximately $200 million less on operations in 2012. If it is assumed that this cost escalation occurred at a constant rate over the 15 years, the total amount spent in excess of inflation would have been approximately $750 million. This is funding that could have been used on Muni service and to pay for additional capital expenditures.

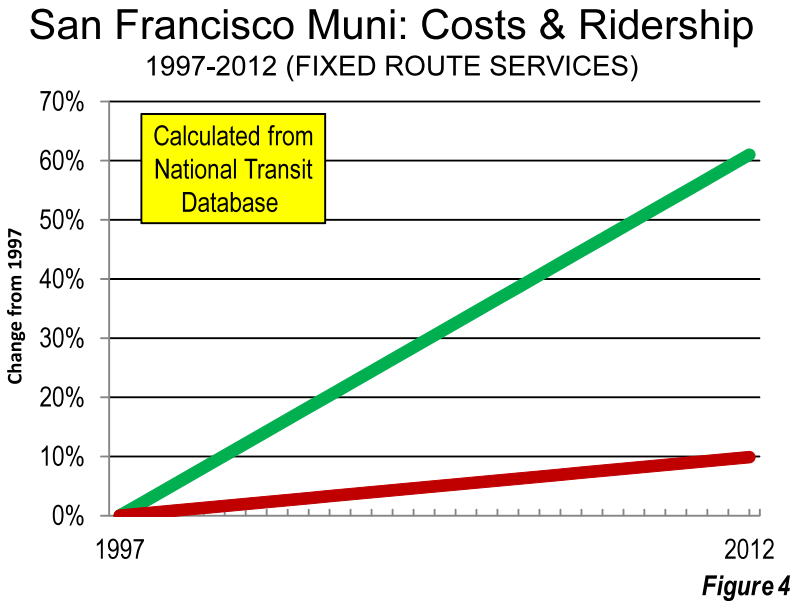

Figure 4

In such an environment, it would be expected that there would be sufficient operating funding to not only adequately maintain the fleet, avoiding the service reliability problems, but also to increase ridership substantially.

Moreover, over the same period, Muni has made substantial investment in new transit systems, including the "T Third Street" light rail line and the Central Subway. The net effect of the decisions to proceed with such expensive investments, while bus service is insufficiently reliable raises questions about spending priorities.[18]

Finally, some of these programs could result in greater traffic congestion (Section 5).

[17] Calculated from National Transit Database information, as reported by Muni.
[18] The combined Third Street-Central Subway was to have cost approximately $1.4 billion in 2012$ (calculated from Federal Transit Administration data, 1997, inflation adjusted). According to SFMTA, the final cost is expected to be $2.2 billion (http://www.centralsubwaysf.com/content/project-fundingbudget), indicating a substantial cost overrun.

4.2 Roads

The second largest funding category in the 2030 transportation plan is road related. There are two principal programs: street resurfacing throughout the city and signal replacement. The resurfacing and signal projects would also include benefits to transit users, pedestrians, and cyclists. Like some transit projects, some of these road projects could lead to *greater* traffic congestion (Section 5).

4.3 Cycling and Walking

The third largest funding category would principally benefit cycling and walking. Nearly $1.0 billion would be spent on cycling and walking. These projects would expand the bicycle network and improve the walking environment, including the "complete streets program." As in the case of some transit and road programs, cycling and pedestrian programs can lead to greater *traffic* congestion (Section 5).

5. Increased Traffic Congestion

The Task Force Report gives little or no attention to the potential for increasing truck and automobile congestion on the city's streets. Nonetheless, some of the elements of the 2030 transportation plan are likely to intensify traffic congestion. These would include the Market Street improvement program, which would give greater priority to transit, cycling, and walking, with the necessary effect of slowing general vehicle travel. Similarly the implementation of additional exclusive bus lanes and taking of capacity from streets for cycle lanes would likely have the same effect.

In a widely cited study, Reid Ewing of the University of Utah and UC Berkeley's Robert Cervero reported only a minimal relationship between higher density and less driving per capita (vehicle miles).[19] In a constrained area, such as the city of San Francisco, this means more traffic congestion. In a meta-analysis of nine studies that examined the relationship between higher density and per household or per capita car travel, Ewing and Cervero found that for each 1 percent increase in density, there is only 0.04 percent less vehicle travel per household (or per capita). This would mean that 10 percent higher density (10 percent more people) would result in an *increase* of a 9.6 percent in total driving (Figure 5). In other words, driving increases nearly as much as density. Any expectation that higher densities will result in reduced traffic congestion seem misplaced. Our own study published in the journal of the Singapore Land Transport Authority found a strong association between higher population densities and both greater traffic congestion and longer average commute times in international cities.[20]

[19] Ewing, R. & R. Cervero (2010), "Travel and the Built Environment," Journal of the American Planning Association, Volume 76, Issue 3, 2010

[20] http://app.lta.gov.sg/ltaacademy/doc/J12%20Nov-p19Cox_Urban%20Travel%20and%20Urban%20Population%20Density.pdf

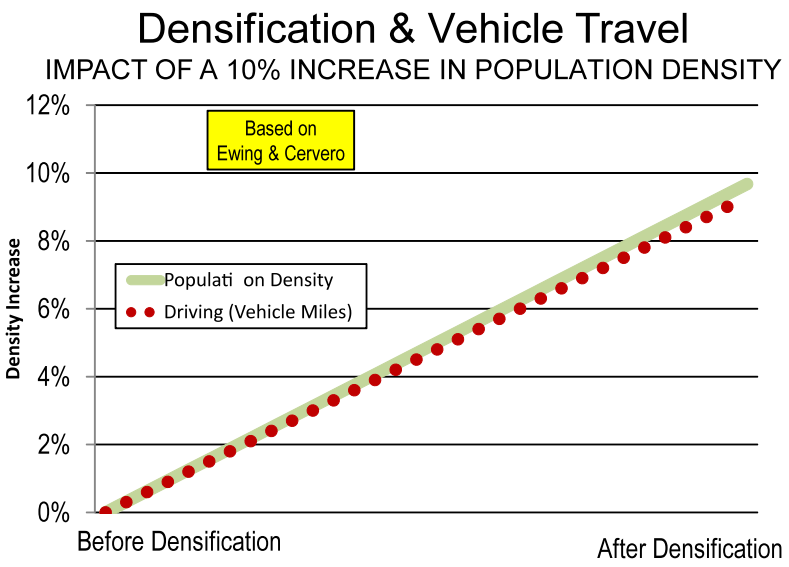

Figure 5

Traffic congestion retards the productivity of the city by increasing travel times and especially by increasing business costs. This is evident in longer delivery trips and service trips (which can reduce the number of service trips performed by a single employee in a day). Further, greater traffic congestion leads to higher air pollution levels at the neighborhood level and negative health risks. For example, research published by the American Heart Association indicates that "air pollution levels vary significantly in urban areas and that people who live close to highly congested roadways are exposed to greater health risks."[21] Finally, because vehicles are less fuel efficient at slower speeds and in "stop and "go" conditions, greater traffic congestion increases greenhouse gas emissions.

These consequences were not adequately addressed in the Task Force Report.

6. Evaluation

Even if all of the new funding initiatives are adopted by the voters and the funding for the balance of the program is identified, it could be most challenging for the city to deliver the 2030 transportation plan as envisioned. There are two principal difficulties:

1. Capital cost escalation: Most of the costs of the 2030 transportation plan are for capital improvements. In the public sector, capital improvements are inherently susceptible to substantial cost overruns. This is evident in California and local projects.

- The California high-speed rail system experienced a cost overrun of between 185 percent and 235 percent before plans were scaled back to eliminate true high-speed rail operations on the San Francisco Peninsula and in parts of Los Angeles.[22]

[21] Robert D. Brook, Barry Franklin, Wayne Cascio, Yuling Hong, George Howard, Michael Lipsett, Russell Luepker, Murray Mittleman, Jonathan Samet, Sidney C.Smith, Jr and Ira Tager (2004), "Air Pollution and Cardiovascular Disease : A Statement for Healthcare Professionals From the Expert Panel on Population and Prevention Science of the American Heart Association," *Circulation: Journal of the American Heart Association,* http://circ.ahajournals.org/content/109/21/2655.full.

[22]Calculated from 1999 projection, adjusted for inflation to 2012. http://reason.org/files/california_high_speed_rail_report.pdf

- The rebuild of the eastern span of the Bay Bridge experienced a cost overrun estimated to be over 200 percent.[23]

- The new Trans-Bay Terminal has experienced cost overruns, which the *San Francisco Examiner* characterized as follows: "Tough to figure what is going up faster - the $1.9 billion Transbay Transit Center or its cost overruns."[24]

- The city's own Third Street Light Rail & Central Subway project has experienced significant cost overruns (Section 3.1).

In a *San Francisco Chronicle* column, former Mayor Willie Brown characterized the hopelessness of relying on early cost projections for major capital projects:[25]

> "News that the Transbay Terminal is something like $300 million over budget should not come as a shock to anyone.
>
> We always knew the initial estimate was way under the real cost. Just like we never had a real cost for the Central Subway or the Bay Bridge or any other massive construction project. So get off it. In the world of civic projects, the first budget is really just a down payment. If people knew the real cost from the start, nothing would ever be approved.
>
> The idea is to get going. Start digging a hole and make it so big, there's no alternative to coming up with the money to fill it in."

Capital project cost overruns are nothing new, nor are they limited to California. A European research team has documented significant cost overruns in most of the nearly 300 major projects analyzed from around the world.[26] In a later paper, the principal author said:

> "...performance in mega-project management is strikingly poor and has not improved for the 70-year period for which comparable data are available, at least not when measured in terms of cost overruns, schedule delays, and benefit shortfalls."[27]

It seems unlikely that the city would be able to deliver on the expensive capital projects in the 2030 plan without significant strategies to ensure that projects stay within budget. This is not simple, though might be accomplished through "design – build" contracts with winning bidders that obligate them to deliver the finished projects within budget, making up for additional expenses from their own reserves.

***2. Escalating operating costs*:** As is noted above, Muni's costs over the last 15 years have risen far more than inflation. Escalating operating costs are the rule, rather than the exception in transit. This occurs because there is no competitive influence to keep transit costs under control. Generally, in the economy, prices tend to rise near the inflation rate (above or below) in competitive industries. Over the last three

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[23] 2013 completion price compared to original 1997 projection, adjusted for inflation. Data from http://www.mercurynews.com/news/ci_23767991/new-bay-bridge-cost-estimates-rose-over-time

[24] http://www.sfgate.com/bayarea/matier-ross/article/Transbay-Transit-Center-s-construction-costs-keep-5486433.php

[25] http://www.sfgate.com/bayarea/williesworld/article/When-Warriors-travel-to-China-Ed-Lee-will-follow-4691101.php

[26] http://www.amazon.com/Megaprojects-Risk-An-Anatomy-Ambition/dp/0521009464

[27] http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2424835

decades transit costs per passenger mile have escalated more than the cost inflation in any major sector of the economy, including health care.[28]

The Task Force Report indicates little or no commitment to cost-effectiveness and generally the transit literature in the United States seems to assume that the answer to every question is more money. Of course, a business in a competitive industry that operated on that basis would be driven out of business by its competition.

There are public policy solutions that can bring transit costs under control, which makes it possible to maximize service levels for the public (and to keep fares low). The best examples are in places like London, which competitively contracted (competitively tendered) all of its bus services between 1985 and 2000. Competitive contracting involves the use of private and public companies to operate individual routes of the transit system for the lowest cost. The public agency (contracting authority, which in San Francisco could be the MTA) defines service levels, route alignments, logos, vehicle liveries, schedules, and virtually every other aspect of the service. The system operates as an integrated whole. London, which has the largest bus network in the world, reduced its operating costs per mile of service by approximately 50 percent over the period of conversion.[29]

Other international cities have followed London's example, such as Copenhagen and Perth, Australia. Stockholm has competitively contracted its bus, commuter rail, and subway systems. Melbourne has competitively contracted its bus and commuter rail systems. In the United States, the largest competitive contracting projects involve buses in Denver and San Diego. In each of these cases, the general outlines of the London approach are followed and substantial savings have been achieved.

The barriers in San Francisco to competitive contracting of bus services are overwhelming. The most important barrier would be the intense opposition of organized labor, which has been successful in blocking proposals in a number of US cities. Moreover, organized labor has carved out exemptions to European Union competitive contracting directives in the larger metropolitan areas, such as Paris. The net effect of this opposition is to deny the greater levels of service that would be possible if the competitive market, managed by the public authorities, were able to produce higher levels of service.

In view of the approximately $750 million in excess operating costs between 1997 and 2012, and with no apparent intensive program underway to control rising operating cost (which may well be impossible given the political situation in San Francisco), it seems highly unlikely that the service expansions promised under the 2030 transportation plan will be achieved.

7. Conclusion

Given these systemic difficulties, SFMTA is unlikely to be able to deliver on the promises of the 2030 transportation plan, even if all of required funding recommended by the Task Force Report is obtained.

Biographical Information: Wendell Cox

Wendell Cox has been intensely involved in the transit industry for four decades. After serving as the chair of the Mayor's San Fernando Valley Transportation Advisory Committee, he was appointed to three terms on the Los Angeles County Transportation Commission (LACTC) by Mayor Tom Bradley and served from 1977 to 1985 (LACTC served a role in Los Angeles similar to that of the Metropolitan

[28] http://www.heritage.org/research/reports/2010/06/washingtons-war-on-cars-and-the-suburbs-secretary-lahoods-false-claims-on-roads-and-transit
[29] www.publicpurpose.com/ut-ct-mon2004.pdf

Transportation Commission in the Bay Area). His motion at a special meeting in 1980 created the Proposition A set-aside for rail transit, which provided the local funding for the first decade of Los Angeles rail construction. While at LACTC, Cox chaired two American Public Transit Association Committees ("Policy and Planning" and "Governing Boards").

In 1999, he was appointed to the Amtrak Reform Council by the Speaker of the U.S. House of Representatives, to fill the unexpired term of New Jersey Governor Christine Todd Whitman, who had resigned.

In 1985, he began a consulting career in transportation, demographics and land use. He is author of *Demographia World Urban Areas*, the only regularly published compendium of population, urban land area and urban population densities for all identified world urban areas with 500,000 or more population (now in its 10th edition). He is co-author of *Demographia International Housing Affordability Survey*, which rates housing affordability in more than 350 metropolitan areas in nine nations (also in its 10th edition).

He has lectured widely, including national speaking tours in Australia and New Zealand and international university lectures and presentations in nearly all American states and Canadian provinces.

Cox has served as a visiting professor at the Conservatoire National des Arts et Metiers, a national university in Paris. He has served as vice-president of CODATU, an organization dedicated to improving mobility in emerging world cities.

He has written books, research papers and policy analyses. He is a frequent commentary contributor, having been published in the newspapers such as the *Daily Telegraph* (London), the *Wall Street Journal, the National Post* (Toronto), the *Los Angeles Times* and the *San Francisco Chronicle.* He also writes a regular column in newgeography.com, which includes its "Evolving Urban Form" series of international metropolitan area analyses.

Cox is author of *Plan Bay Area Evaluation*, published by the Pacific Research Institute.

He is principal of Demographia (Wendell Cox Consultancy) in the St. Louis metropolitan area. He holds a Bachelor's degree in government from California State University, Los Angeles and an MBA from Pepperdine University, Los Angeles.