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Auto Trips Generated: The Standard that Ate the Bicycle Network

Posted By [Marc Salomon](#) On July 29, 2010 @ 9:37 am In [Environment, Land Use, Opinion, Politics, Transportation](#) | [2 Comments](#)



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Image courtesy SFMTA.

By [Marc Salomon](#)

July 29, 2010

The California Environmental Quality Act (CEQA) has bedeviled efforts to alter the streetscape of San Francisco to implement voter approved Transit First policies for the past decade. But it appears now that efforts to change the way that CEQA works have been as ill conceived as the fundamental analysis of the problem has been in error.

The initial assumptions were that existing CEQA practice required an Environmental Impact Report (EIR) in cases where an initial study of a project indicated that removing an automobile lane in favor of a bicycle lane, or a transit lane, would likely delay private auto traffic to below a significant threshold. To determine whether there was an environmental impact, as measured by the auto Level of Service (LOS) metric, would require an expensive and time-consuming analysis of traffic circulation.

The thinking was that if we could change the standards so that private auto LOS was no longer considered an environmental impact, and was replaced, instead, with a standard that realistically measured actual environmental impacts or projects – the science would be accurate, projects would not be delayed, and the City would be relieved of having to spend \$100 thousand to study the problem.

So was born the notion of the Automobile Trips Generated (ATG) metric. Beginning around 2002, the ATG metric was conceived by City and Transportation Authority staff and has been in development since. ATG would measure the number of new auto trips a project would generate and based on that would generate a metric that would determine the environmental impacts of a project on the street network.

Under ATG, each auto trip would be considered an environmental impact and would be mitigated by a predetermined impact fee. A bike lane project would have zero ATG impact, while a luxury condo building with one-to-one parking would generate some positive number of auto trips based on parking spaces and any other applicable considerations. The calculated impact fees would go to the MTA. As of mid 2010, the ATG standard has yet to be completed. The development of a minimally complicated standard has taken longer than it took to do real rocket science, to conceive and execute the Apollo project in the 1960s.

This was all based on the assumption that the only significant environmental impact that removing an auto lane for transit or bike lanes would entail, is to degrade private auto LOS. That practice, and the law, has evolved to the point where we were considering a social impact of auto delay as if it were an environmental impact. According to the Bay Area Air Quality Management District (BAQMD), emissions technology has improved since standards were developed in the mid 20th century to the point where contemporary engines do not collectively emit sufficient pollutants as to constitute a significant environmental impact.

Developers salivated at the thought of being absolved of funding expensive transportation circulation studies for their buildings, preferring to have the certainty of a fee, which had been predetermined to mitigate some fraction any impacts their projects would entail, and quickly came on board, which opened the door to support from the Mayor Gavin Newsom and conservative supervisors. Of course, the fee only covered a fraction of the impacts, with San Franciscans being expected to eat the rest without compensation.

As the ATG standard was slowly moving through the bureaucracy, the 2002 Bicycle Plan Update was simultaneously progressing through the pipeline. Several of us warned that issues with LOS were going to trip up the omnibus document. But we were successfully marginalized as disruptive obstructionists by the nonprofits and City staff. Under political pressure, the Bicycle Plan was granted a General Rule Exclusion (GRE) from CEQA analysis at the vociferous request of bicycle advocates. The GRE is used for projects that cannot possibly have an environmental impact even though we 'disruptive obstructionists' knew that auto LOS remained a live wire.

[The BP Macondo well in the Gulf of Mexico received a similar exemption from federal NEPA environmental analysis, because it was "obvious" that deep water drilling is so safe that there would never be a blow-out and the abundant tropical Walrus populations in the Gulf of Mexico, described by BP's disaster response plan, would never be threatened. Besides, the region needed jobs.]

But the lawsuit filed by Mary Miles and Rob Anderson revealed that the City erred not only in assuming that the only impacts of removing auto lanes for bike lanes would be in degraded auto LOS, it also did not even contemplate that transit impacts would be a legitimate environmental impact. The Miles lawsuit was successful because CEQA errs on the side of complete analysis, and the legal bar for challenging a GRE is very low.

Cities have great flexibility to customize CEQA standards and thresholds, but there are certain immutable requirements that jurisdictions inherit from the statute to which they must comply. One of these areas affirmatively occupied by state law is the mandate that jurisdictions analyze potential impacts of projects on public transit. The standards and thresholds of significance for evaluating impacts on public transit had traditionally been as a measure of capacity. If a project would involve housing or job creation, then some portion of those residents or workers living and working in those buildings would increase the load on the proximate transit resources

But apparently starting around 2005 [see attached memo below], the City began to study the impacts of projects on transit delay.

The Candlestick EIR of 2007 [1] speaks to the impacts of congestion on transit vehicle speed, on reintegration into traffic after making a stop, and on passenger boarding delays:

6. Transit Delay Methodology

Project impacts to transit measured in terms of increases to transit travel times on routes serving the Project vicinity which would be most likely affected by congestion associated with

Project-generated vehicle trips. The analysis evaluated the increases to transit travel times associated with the following three influencing factors. [*]

- Traffic congestion delay—Traffic congestion associated with increases in area traffic slow down transit vehicles and results in increased transit travel times. Traffic congestion delays were calculated by summing the average vehicular delay at each intersection along the transit line's route within the study area. The increase in total route segment delay is equal to the increase in travel time associated with the Project.

- Transit re-entry delay—Transit vehicles typically experience delays after stopping to pick up and drop off passengers while waiting for gaps in adjacent street traffic in order to pull out of bus stops. As traffic volumes on the adjacent street increase, re-entering the flow of traffic becomes more difficult and transit vehicles experience increased delay. Transit re-entry delay was calculated using empirical data presented in the 2000 Highway Capacity Manual (HCM). Total transit re-entry delay for each route was calculated as the sum of transit re-entry delay at each stop within the study area.

- Passenger boarding delay—Although increases in transit ridership are generally viewed positively, the amount of time a transit vehicle has to stop to pick up and drop off passengers (i.e., the transit vehicle dwell time) is directly correlated to the number of passengers boarding the vehicle. If, as proposed, the Project includes substantial improvements to transit service in the future (and as general transit ridership grows), vehicles would have to spend more time at stops, which may increase overall transit travel times. Passenger boarding delay was calculated assuming two seconds per passenger boarding for buses, and 0.5 seconds per passenger boarding for light rail vehicles. Passenger boardings within the study area were estimated by examining the increases in ridership across the study area cordons.

[*] The methodology used is similar to that used in the San Francisco Bicycle Plan Draft EIR, San Francisco Planning Department, November 2008, except that methodology included the additional transit delay associated with substantial increases in bicycle volumes, which was appropriate for a project contemplating large-scale changes to the City's bicycle network. Bicycle volumes are not expected to substantially change as part of this project, so the bicycle delay was not included. However, instead, this evaluation includes the added delay associated with increases in passenger boardings, which is more appropriate for this project since the project includes major improvements to area transit service.

The CMPC Cathedral Hill EIR of 2005 [2] includes transit-delay mitigation measures as follows:

CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 38/38L-Geary bus routes is reduced to a less-than significant level by financially compensating the SFMTA for the cost of providing the service needed to accommodate the project at proposed levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

If preliminary studies indicate that a project would impact transit, according to § 21092.4 of CEQA, an EIR is required to disclose the nature of those impacts and suggest mitigation measures to decision makers. Clearly, a well functioning transit system is an environmental asset, and projects that delay transit negatively impact the environment. In San Francisco in particular, Muni has been on the receiving end of all sorts of hell.

From the green lighting of massive new development envelopes on the east side of town, with all of those new parking spaces, to the Newsom's pilfering of Muni funds for his "work orders," Muni is trying to dig itself out of a hole by optimizing projects such as the Transportation Effectiveness Project. Surface transit speeds average less than 7 miles per hour. The 9 mph figure cited in the press includes the Metro lines in the subway. The last thing Muni needs under these trying conditions is for allies in the alternative transportation community to be throwing soil on the transit system as we try to dig it out of a hole.

The cruelty here is that the analysis required to determine transit delay is the same analysis required to analyze auto delay, of the same complexity that we had tried to avoid, according to the Parkmerced EIR of 2010:

The calculation of transit travel time as a result of roadway congestion is based on movement delays calculated at intersections as part of the intersection LOS analysis. [3]

Transit delay is a secondary impact of any project that causes auto delay. Even with ATG, the City must still perform what has traditionally been time-consuming and expensive circulation analysis to figure out the cascading effects of removing a lane of auto traffic on increasing congestion on surrounding roadways to see how it effects surface transit. There is no shortcut.

Similar to the omnibus Bicycle Plan EIR, ATG is so complicated that it contains innumerable toeholds for legal challenges to the methodologies involved. Were it to be implemented and replace LOS, each moving part would be in court for years, if not decades. We need standards, in these instances, to pass the "bathroom scale test," a common practice in devising Internet protocol specifications. The Bathroom Scale Test holds that that any standards document produced which registers weight on a bathroom scale is too complex. The Bicycle Plan EIR and proposed ATG standards fail this test and that is their shared vulnerability.

So after the better part of a decade chasing ATG down rat holes, after being taken to school in court by Rob Anderson and Mary Miles, it turns out that the City is going to have to follow CEQA and do it right after all. The only honest question before us now is how can we streamline that process of assessing impacts on transit from projects so that we can produce and implement bicycle safety facilities in real time?

First off, the City is going to have to develop the expertise in-house to produce these EIRs or "Mitigated Negative Declarations" which include steps that mitigate all impacts, thus avoiding an EIR. The major costs of EIRs as currently produced involve time and money. The bidding process for consultants takes a minimum of three months. This needs to be resolved by developing in-house analytical capacity so that the City does not have to go through a cumbersome and time-consuming process of contracting out EIRs. CEQA also requires a public approvals process that can last the better part of a year. We can't change that, so we've got to optimize our process to deal with that reality.

Second, the City is going to have to home-grow staff expertise with traffic circulation models to comply with state law requiring study of impacts of projects on transit as measured by various contributors to delay. One can only assume the worst for the methodologies that each consultant uses to reinvent the wheel of circulation analysis. The City needs to own that knowledge and process so that it can be deployed in real time. The bulk of the EIRs for these projects are largely boilerplate.

Third, the City must develop accurate and legitimate standards and thresholds to measure and evaluate transit delay. The sudden fabrication of a standard and threshold of significance of transit delay is welcome, but has not been legitimized with substantial evidence as required by law. The City needs to comprehensively study contributing factors to transit delay and establish standards for measuring delay as well as thresholds of significance above which the environment is impacted. The true measure of environmental impacts for transit delay is the tipping point where mode shifts, either positively by encouraging transit over autos, or negatively by delaying transit so that riders abandon transit to become drivers.

Under state law it must establish thresholds for handling cumulative impacts so that private projects are not permitted to off-load their impacts to trickle down on the transit riding public by incrementally slowing down Muni. Even alternative transit projects like bicycle lanes must "move to the back of the bus" in favor of speedy transit.

Finally, City must revisit the Octavia Market and Eastern Neighborhoods neighborhood plans as well as the Bayview Redevelopment plan to ensure that their environmental impacts are disclosed to the public and to decision makers. Anything less will shift the impacts of profitable new development from project sponsors onto the backs of beleaguered Muni riders in the form of countless uncompensated hours spent delayed in transit.

The holy grail of alternative transportation is a mode shift from private autos. The gold standard in inducing mode shift is a robust, reliable rapid transit system. Vapid transit does not cut it – and actually induces mode shift back towards private autos. This is going to require environmental analysis and that's a good thing when it comes to safeguarding Muni. We'd do well to quit fighting it and gear up to do it right.

Instead of blaming Anderson and Miles for their error, alternative transportation advocates should be thanking them for forcing the City to consider impacts on transit as we move forward our bicycle agenda. Under our system of government, it is always okay to go to court to sue the executive branch to command compliance with the law. It is especially unacceptable for those who urged breaking the law to blame those who went to court for exposing that short cut. Don't do the crime if you can't do the time.

The best way to avoid legal process delays like this is to do it right the first time, next time, learning from our errors. Had the City done it right the first time, we would be well into implementing the bulk of 1997 bicycle lane network and other improvements which comprised the bulk of the 2002 update that was held up in court. We are really that far behind. Yet we are still in court begging the judge to see things our way and still anticipating only a partial lifting of the injunction. And it does not appear that the MTA Bicycle Program is involving the public in the planning of the next generation of bicycle improvements, or if they are even planning for the future.

Marc Salomon is a San Francisco cyclist and has reluctantly become intimately familiar with the California Environmental Quality Act.

Foot Notes

[1] Hunters Point Shipyard EIR:

<http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=284>

[2] CPMC Cathedral Hill EIR:

http://www.sf-planning.org/ftp/files/MEA/2005.0555E_CPMC_DEIR_Vol1_pt4.pdf

[3] Parkmerced EIR:

<http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=8093>

California Environmental Quality Act:

§ 21092.4. Consultation with transportation planning agencies and public agencies

(a) For a project of statewide, regional, or areawide significance, the lead agency shall consult with transportation planning agencies and public agencies that have transportation facilities within their jurisdictions that could be affected by the project. Consultation shall be conducted in the same manner as for responsible agencies pursuant to this division, and shall be for the purpose of the lead agency obtaining information concerning the project's effect on major local arterials, public transit, freeways, highways, overpasses, on-ramps, off-ramps, and rail transit service within the jurisdiction of a transportation planning agency or a public agency that is consulted by the lead agency. A transportation planning agency or public agency that provides information to the lead agency shall be notified of, and provided with copies of, environmental documents pertaining to the project.

(b) As used in this section, "transportation facilities" includes major local arterials and public transit within five miles of the project site and freeways, highways, overpasses, on-ramps, off-ramps, and rail transit service within 10 miles of the project site.

DATE: October 8, 2008

TO: Carol Levine, Shruti Malik, WSA

Jose Farran, Adavant Consulting

Chi Hsin Shao, CHS Consulting

FROM: Bill Wycko, Debra Dwyer, Monica Pereira, MEA

RE: Transit Delay Threshold Criteria for the San Francisco Bicycle Plan

Project, Case No. 2007.0347E

The Threshold of Significance for transit impacts is as follows. For transit lines where the headway is equal to or less than six minutes, the impact is significant if the sum of delay in both directions is greater than or equal to the headway. For transit lines where the headway is greater than six minutes, the impact is significant if the sum of the delay in both directions is equal to or greater than six minutes.

The six minutes threshold was calculated based on the following assumptions:

- The average headway for all Muni lines without taking into consideration the number of the runs per line is approximately 12 minutes.

- Assuming on average one transfer per transit trip, each transit trip would involve two buses. The average headway of 12 minutes was assumed to be the total headway for the two transit lines. Therefore for each transit line the average headway is assumed as half of the 12 minutes which equals six minutes.

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