



HEXAGON TRANSPORTATION CONSULTANTS, INC.

November 7, 2019

Ms. Reena Brilliot
Community Development Department
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Re: *Evaluation of Potential Travel Demand Management Trip Reductions for the Approved Yahoo! Office Development at 3005 Democracy Way*

Dear Ms. Brilliot:

Hexagon Transportation Consultants, Inc. has evaluated the potential Travel Demand Management (TDM) trip reductions for the previously approved Yahoo! office development at 3005 Democracy Way. The analysis is in response to questions raised at the City of Santa Clara Planning Commission meeting on October 23, 2019. The City is considering amending the current development agreement to extend the term of the agreement. As originally approved, the Yahoo! project would contain 3,060,000 square feet (s.f.) of office space and was not subject to a TDM trip reduction target. Subsequently, the City of Santa Clara adopted a Climate Action Plan that set forth goals for reducing vehicle miles travelled (VMT). The minimum VMT reduction established for high intensity office/R&D uses in the project vicinity is 20 percent with a minimum 10 percent reduction from TDM. The Planning Commission suggested that other jurisdictions are requiring greater vehicle trip reductions from TDM and questioned whether a 35 percent vehicle trip reduction would be achievable for the approved Yahoo! development.

Our analysis of potential trip reductions for the Yahoo! office development was conducted using available TDM Monitoring Report data from other similar office projects in the area. Assuming that all vehicle trips will average out to a typical trip length (all trip lengths are equal), a one percent reduction in vehicle trips will equal a one percent reduction in vehicle miles travelled. Thus, the following analysis of vehicle trip reductions is thought to be a reasonable estimate of the reduction in VMT.

TDM Case Study Data

TDM performance data was compiled for office projects in a number of South Bay and Peninsula cities (see Table 1). The data was obtained from TDM Monitoring Reports and other studies provided by TDM Specialists, Fehr & Peers, Nelson/Nygaard, and the City of Sunnyvale. The case study data describes the site location (City and proximity to transit), number of employees, TDM measures, alternative mode use rate, and total trip reduction percentage for each site.

The TDM monitoring reports generally calculate the alternative mode share assuming that all employees who do not complete a survey commute in a single-occupant vehicle (SOV). The intent behind this assumption is to avoid survey bias due to a non-representative sample. For example, SOV commuters may be less likely to respond to a commute survey than commuters who use alternative modes. However, it is likely that some non-respondents also use alternative



modes of transportation. Thus, the true alternative mode share is likely somewhere between the unadjusted value calculated from survey respondents and the adjusted value calculated assuming all non-respondents are SOV commuters. Thus, the alternative mode share and resulting vehicle trip reduction percentage achieved at each site is reported as a range. For sites with a low survey response rate, the range is relatively large.

The TDM trip reductions listed below should be measured against the trip generation rates per employee provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. The ITE data are typically based on single-use developments located in suburban areas with ample free parking and minimal transit service or other TDM measures, and thus represent an upper bound estimate against which to measure the overall trip-reducing effects resulting from the project location, design features, and other TDM measures. The TDM Monitoring Reports typically list the total number of employees but not the floor area. Thus, it is uncertain how the employee density (employees/s.f.) at each local site compares to the typical ITE employee density or how the local trip reductions reported below compare to the ITE trip rates per 1,000 s.f. gross floor area.

Because the TDM Monitoring Reports are based on surveys distributed to all employees, including those who travel during off-peak periods, the trip reductions reported below reflect the reduction in daily vehicle trips. Peak-hour trips may be reduced by a greater percentage if the employer(s) allow flexible work hours or alternative work schedules (such as 4 days/40 hours or 9 days/80 hours). Since the type of employer(s) that might occupy the Yahoo! site are unknown, it is recommended that the same trip reduction target be applied to daily and peak hours.

Office developments in close proximity to Caltrain were excluded from this analysis since Caltrain ridership greatly exceeds the VTA light rail ridership. Thus, sites served by Caltrain are not comparable with the Yahoo! site since they typically benefit from much higher rates of transit use.

The remaining office developments were divided into two categories: with and without long-haul employee commuter shuttles. Many of the largest technology employers in Silicon Valley (e.g. Google, Facebook, LinkedIn, etc.) provide an extensive system of employee commuter shuttles, which transport employees to and from their homes in such distant locations as San Francisco, Gilroy, the East Bay, and more. The shuttles typically provide Wi-fi connections that allow employees to work while onboard and to avoid the stress of driving. While some smaller employers and Transportation Management Associations sometimes offer last-mile shuttle service to and from the nearest transit stations, they do not provide long-haul employee shuttles due to the cost and, in some cases, due to competitive concerns arising from shared long-haul shuttles.

Trip Reductions without Long-Haul Employee Commuter Shuttles

The City of Santa Clara does not have any TDM monitoring data available at this time for office projects. Nevertheless, data was obtained from a third-party consultant for a large (>1,000 employees) single-employer office campus in Santa Clara. However, it is not near light rail or Caltrain and provides only a limited set of TDM measures including bicycle parking, showers, carpool preferential parking, an in-house commute web portal, pre-tax options for transit expenses, and carpool ride matching. The Santa Clara office development (Site #1) had approximately 12 – 27 percent of employees using alternative modes, resulting in a trip reduction



of about 10 – 23 percent. (Carpools count as an alternative mode but are assumed to reduce only one vehicle trip for every two employee participants.)

One other large (>1,000 employees) single-employer office campus in the City of Sunnyvale's Moffett Park Specific Plan Area is directly comparable to the approved Yahoo! office development since they both are located approximately one quarter mile from the Mountain View - Winchester LRT line. This Sunnyvale site (Site #2) provides a similar TDM Program with the addition of Waze carpool incentives not provided at the Santa Clara site. The TDM Monitoring Report shows that the Sunnyvale site had approximately 14 – 35 percent of employees using alternative modes, resulting in a trip reduction of about 12 – 30 percent. Although the Sunnyvale site that is near LRT transit appears to be achieving a higher trip reduction than the Santa Clara site that is not near rail transit, the transit mode share at both sites is nearly identical. The difference in trip reduction between the two sites is due to other factors such as the presence or lack of carpool incentives, the site's accessibility via bicycle, and the percentage of employees who telework or did not work during the survey period.

TDM monitoring data also were obtained for two other office developments (Site #3 in Mountain View and Site #4 in East Palo Alto) that do not have company-provided long-haul employee commuter shuttles. The Mountain View site is a large (>1,000 employees) single-employer office campus, while the East Palo Alto data is from a medium-sized employer (approximately 300 employees) within a multi-tenant office development. These sites offer enhanced TDM programs including transit subsidies (Caltrain Go Pass or other cash subsidy) and shuttle service to the nearest Caltrain station. The trip reductions for these sites are estimated to be between 18 and 32 percent.

On average, the four office developments without long-haul employee shuttles service were found to achieve trip reductions of about 16 – 29 percent. These results support our conclusion that the Yahoo! office development could achieve vehicle trip reductions of approximately 25 percent with implementation of TDM measures such as bike parking, showers, lockers, last-mile shuttle service to nearby transit stations (Caltrain, BART, and/or ACE), carpool ride matching, carpool preferential parking, personalized commute assistance, new hire orientation, commute kiosk, intranet site with commute information, promotional events and other TDM marketing and information programs.

Trip Reductions with Long-Haul Employee Commuter Shuttles

The office tenant(s) for the Yahoo! site could be numerous small employers or one large employer. If a large tech employer were to occupy the full site, it would likely provide a network of employee shuttles. Hexagon evaluated the trip reductions achieved at nine office developments with company-provided employee commuter shuttle service. In addition to long-haul shuttles, these sites also benefit from robust TDM Plans that typically include transit subsidies as well as local shuttle services to Caltrain or other transit stations. The average trip reduction at these sites is estimated to be about 31 to 42 percent. These results support our conclusion that a trip reduction goal greater than 30 percent would likely be achieved only by a very large employer that invested in extensive long-haul employee commuter shuttle services.



Conclusions

The recommended TDM trip reductions should be measured against the daily and peak-hour trip generation rates per employee provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. Based on TDM case study data, it appears that the Yahoo! office development could achieve a 25 percent vehicle trip reduction with implementation of TDM measures such as bike parking, showers, lockers, last-mile shuttle service to nearby transit stations (Caltrain, BART, and/or ACE), carpool ride matching, carpool preferential parking, personalized commute assistance, new hire orientation, commute kiosk, intranet site with commute information, promotional events and other TDM marketing and information programs. This is a progressive target given that comparable sites that do not use long-haul shuttles were found to achieve an average vehicle trip reduction of about 16 to 29 percent. A trip reduction goal greater than 30 percent would likely be achieved only if the project were to be occupied by a single large employer that invested in extensive long-haul employee commuter shuttle services.

Sincerely,

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Michelle Hunt
Vice President

**Table 1
Case Study TDM Data**

Site ID	1	2	3	4	5	6	7	8	9	10	11	12	13	Avg	Avg	Avg
City	Santa Clara	Sunnyvale (Moffett Park)	Mt View	East Palo Alto	Palo Alto	Mt View	Palo Alto	Mt View	Menlo Park	Mt View	Cupertino	Sunnyvale (Moffett Park)	Sunnyvale (Moffett Park)	All Sites	No Long-Haul Shuttle	With Long-Haul Shuttle
Total Employees	>1000	>1000	>1000	300	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000			
Caltrain Proximity	2+ Miles to Caltrain															
Company-Provided Employee Commuter Shuttles	No Long-Haul Employee Shuttles						Company-Provided Long-Haul Employee Commuter Shuttles									
Bus and/or LRT Service	Bus only	Yes (0.3 miles to LRT)	no (3/4 mi from bus & LRT)	Bus only	Bus only	no (3/4 mi from bus & LRT)	Bus only	limited bus service only	no	Bus only	Bus only	Yes (0.1 miles to LRT)	Yes (0.5 miles to LRT)			
Transit Subsidies	none	none	Caltrain Go Pass	cash subsidies	VTA Express Eco Pass; \$130 cash subsidy	Caltrain Go Pass	VTA Eco Pass (small cost to employee)	Caltrain Go Pass; \$100 cash subsidy	Caltrain Go Pass	none	\$100 cash subsidy	cash subsidies	none			
Last Mile Station Shuttle	none	none	Caltrain Shuttle	Caltrain Shuttle	Caltrain & ACE Shuttle	Caltrain Shuttle	Caltrain & Marguerite Shuttle	Caltrain Shuttle	Caltrain Shuttle	Caltrain & ACE Shuttle	none	none	Caltrain Shuttle			
OTHER TDM PROGRAMS																
Bicycle amenities (secure bike parking and showers)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes			
Campus Bike Share resources			yes		no	yes	no	yes	yes	yes						
Carpool preferential parking spaces	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes			
On-site Carshare resources - Zipcar/WeCar			no		Zipcar	yes	no	yes	yes	yes						
On-site amenities (café, fitness center, PurpleTie, ATM, personal/other amenities)		yes	yes		yes	FREE	yes	yes	FREE	yes		yes	yes			
Constrained or limited parking			yes		yes	yes	yes	no	yes	yes						
Parking cash out					-											
On-site Transportation/Commuter kiosks		yes	yes		yes	no	no	no	no	no			yes			
In-house Commute Web portal	yes		yes		yes	yes	yes	basic	yes	yes		yes				
Emergency Ride Home Program	yes		pending	yes	yes	yes	yes	yes	yes	yes		yes	yes			
Pre-tax options (transit or vanpool)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes			
\$20 monthly bicycle vouchers					no	no	yes	no			yes					
Bicycle commuter incentives					no	no	no	no		yes	yes					
On-site mobile bike maintenance services	yes		yes	yes	yes	yes	yes	yes	yes	yes		yes				
Vanpool Program (vans provided or subsidized)			no		\$130 subsidy	FREE	subsidized	FREE	FREE	yes			yes			
Carpool parking permit program			no		yes	no	no	no	no	yes						
Waze Carpool Incentive		yes										yes	yes			
Company In-house Ridematching Services	yes	yes	Scoop	yes	Scoop & TwoGo	no	Scoop	Zimride	Zimride	yes	yes		yes			
Use of free 511 Ridematching Services		yes			no	yes	no	no	yes	no						
Proactive Employee Commute Coordinator		yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes			
Member - Transportation Management Association		yes	yes	yes	yes	yes	no	yes	no	yes		yes	yes			
Estimated Alternative Transportation Mode-Use Rate (Assuming Non-respondants are SOV)	11.9%	14.4%	32.3%	23.0%	31.3%	40%	30%	38%	45%	50%	28.0%	38.1%	13.8%	30.4%		
Transit Mode %	3.2%	2.9%	5.6%	7.6%	8.4%						13.0%	18.6%	7.5%	8.3%		
Carpool Mode %	3.5%	4.6%	16.1%	7.4%	9.3%						10.0%	2.1%	4.2%	7.2%		
Telework %	1.2%	4.4%	2.4%	4.0%	8.2%							5.2%	1.3%	3.8%		
Uber/Lyft Mode %	0.0%	0.0%	1.5%	1.0%	0.4%							1.4%	0.0%	0.6%		
Bike Mode %	2.8%	0.5%	3.3%	1.0%	2.1%						2.0%	2.3%	0.7%	1.8%		
Walk/Jog Mode %	0.3%	0.1%	1.1%	0.3%	0.2%						3.0%	0.0%	0.1%	0.6%		
Motorcycle/Scooter Mode %	0.8%	0.0%	0.8%	0.6%	0.3%							0.0%	0.0%	0.4%		
Vanpool Mode %	0.1%	0.0%	0.0%	0.0%	1.1%							0.0%	0.0%	0.2%		
Did not work this day %	0.0%	1.9%	1.5%	1.2%	1.3%							8.5%	0.0%	2.1%		
Minimum Total Trip Reduction %	-10.2%	-12.1%	-22.8%	-18.3%	-26.3%	-35.0%	-26.0%	-33.0%	-40.0%	-45.0%	-23.0%	-35.7%	-11.7%	-26.1%	-15.8%	-30.6%
						<i>* estimated</i>	<i>* estimated</i>	<i>* estimated</i>	<i>* estimated</i>	<i>* estimated</i>						
Estimated Alternative Transportation Mode-Use Rate including only Survey Respondants	27.3%	35.1%	43.3%	40.0%	62.4%	n/a	n/a	n/a	n/a	n/a	28.0%	58.6%	43.2%	42.2%		
Transit Mode %	7.4%	7.0%	7.5%	13.1%	16.7%						13.0%	29.3%	23.0%	14.6%		
Carpool Mode %	8.0%	11.2%	21.6%	12.9%	18.5%						10.0%	3.4%	13.3%	12.4%		
Telework %	2.8%	10.7%	3.2%	7.0%	16.3%							8.1%	4.3%	7.5%		
Uber/Lyft Mode %	0.0%	0.0%	1.9%	1.8%	0.8%							0.9%	0.0%	0.8%		
Bike Mode %	6.4%	1.3%	4.5%	1.7%	4.2%						2.0%	3.6%	2.2%	3.2%		
Walk/Jog Mode %	0.7%	0.3%	1.5%	0.5%	0.4%						3.0%	0.0%	0.4%	0.8%		
Motorcycle/Scooter Mode %	1.8%	0.0%	1.0%	1.1%	0.6%							0.0%	0.0%	0.6%		
Vanpool Mode %	0.2%	0.0%	0.0%	0.0%	2.2%							0.0%	0.0%	0.3%		
Did not work this day %	0.0%	4.6%	2.1%	2.0%	2.6%							13.3%	0.0%	3.5%		
Maximum Total Trip Reduction %	-23.3%	-29.5%	-30.6%	-31.8%	-52.3%	n/a	n/a	n/a	n/a	n/a	-23.0%	-56.0%	-36.6%	-35.4%	-28.8%	-42.0%