

## MEMORANDUM

**To:** Sandi Domingue, Hexagon  
**CC:** Lisa Ring, City of San Mateo  
**From:** Jessica ter Schure  
**Date:** October 27, 2009  
**Subject:** 92 and Delaware Trip Reduction Plan

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### Introduction

A new office development is being proposed at Concar Drive in the Hayward Park TOD Zone. For the purpose of Nelson Nygaard's trip generation analysis contained in this memorandum, the project density is assumed to be 325,000 square feet. The applicant has submitted the project with a total square footage that is lower than 325,000 square feet. The application shows a total square footage of 276,467. The applicant is proposing a parking ratio of 2.85 spaces per 1,000 square feet. The garage at Building One includes 245 spaces. The garage at Building Two includes 543 spaces. The total parking proposed is 788 spaces.

This project will be one of the first projects to be developed within the San Mateo Rail Corridor (Transit Oriented Development Plan, adopted June 6, 2005) (the "Rail Corridor Plan"). A goal of the Rail Corridor Plan "is to achieve an overall reduction in new vehicle trips of at least 25 percent corridor wide. It is recognized that this reduction will occur over time and that the reduction achieved by individual projects will vary based on the specific characteristics of the project, such as location and proposed uses" (p. B-11). Since the project is located within the Hayward Park TOD Zone, there is even a larger reason for achieving a trip reduction goal of 25%.

Within this document, we estimate the number of vehicle trips that will be generated by the proposed development using both the weighted average trip rates shown in the Institute for Transportation Engineers (ITE) *Trip Generation* manual as well as the URBEMIS software model. In addition, a number of Transportation Demand Management (TDM) programs are evaluated to determine the potential for reduction in the number of vehicle trips generated by this development. The list of measures includes the following strategies:

- Bicycle storage/parking
- Shower/changing facilities
- Guaranteed Ride Home program
- Information on transportation alternatives

- Carpool matching program
- Preferential parking for carpools/vanpools
- Employee transportation coordinator
- Transportation Management Association (TMA) participation
- Parking reduction
- Carsharing
- Shuttle participation
- Flexible work hours/telecommuting
- Option to participate in the Caltrain GO Pass program

In addition to the TDM measures listed above, the applicant is considering including plug in stations for electric and hybrid vehicles. While this is not considered a trip reduction measure, the inclusion of a charging station can help encourage the use of alternative fuel vehicles and reduce the development's carbon footprint.

Hines will be expected to meet the trip reduction goal of 25% by implementing TDM measures that are taken from this menu of options. Alternatively, Hines may implement TDM measures that are not within this menu, should feasibility of such measures improve at a later date. It is expected that Hines will continue to modify and refine the TDM program over time, to address market conditions or to respond to TMA survey results.

## **Hines Proposed Trip Reduction Program**

Hines is proposing to implement the following trip reduction measures:

1. **Bicycle storage:** The applicant will provide 9 secure bicycle parking facilities with between 5 and 10 spaces each in the parking garage. This meets the requirement of the City Municipal Code (27.64.262): "A minimum of one bicycle parking facility shall be provided in parking lots and parking structures containing from thirty (30) to one hundred (100) parking stalls with another such facility being provided for each additional one hundred (100) parking stalls or fraction thereof. Additional bicycle facilities shall be provided where projected usage as determined by the Zoning Administrator indicates a greater need." The provision of plentiful secure bicycle parking will make it easier and more convenient for employees to bicycle to work.
2. **Shower Changing Facilities:** The applicant will provide shower and changing facilities onsite to encourage employees to bicycle, run and walk to work.
3. **Guaranteed Ride Home Program:** The applicant will participate in the Alliance's Emergency Ride Home program ([www.commute.org](http://www.commute.org)). Emergency Ride Home (ERH) programs provide an occasional subsidized ride to commuters who use alternative modes, for example, if a bus rider must return home in an emergency, or a carpooler must stay at work later than expected. ERH programs may use taxis, company vehicles or rental cars. ERH trips may be free or they may require a modest co-payment. The cost of offering this service tends to be very low because it is seldom actually used.
4. **Information on Transportation Alternatives:** A transportation board with up-to-date information on transit, ridesharing (e.g. 511.org), carsharing, bicycling and other alternative

transportation will be located in a central location within the development. The developer is considering providing a computer with links to relevant transportation information.

5. **Carpool Matching Program and Preferential Parking for Carpools/Vanpools:** Information on existing carpool matching programs such as 511.org will be provided to employees. Parking spaces located near the entrance to the garage facilities or elevators will be designated parking for carpools and vanpools. These measures can encourage and incentivize ridesharing among employees and is a cost-effective method to reduce single-occupancy vehicle trips that can lead to significant results in automobile-oriented communities.
6. **Employee Transportation Coordinator:** A staff member within property management will be a designated transportation coordinator. This person will communicate with the TMA once it is formed, and will also be responsible for maintaining the TDM Program. This includes providing new employees with a welcome package about transportation, updating the transportation information site, monitoring bicycle parking usage and requesting more bicycle parking if need arises, etc.
7. **TMA Participation:** The applicant will become a member of the yet to be formed San Mateo Corridor Plan TMA, a member-controlled transportation management association that will encourage efficient use of transportation and parking resources in the Hayward Park TOD Zone and other Rail Corridor Plan areas. Many of the TDM tools discussed in this report could be efficiently administered through a TMA.
8. **Parking Reduction:** There is a significant correlation between the quantity of parking provided and employee mode split. It is typically assumed that the Institute of Transportation Engineers' Parking Generation handbook equates to unconstrained parking demand, since average parking generation rates are based on observations made at single-use sites in suburban locations with free parking, little or no transit service and no transportation demand management programs. The proposed development will have 2.85 parking spaces per 1,000 sq. ft. or more, which is less than the City's parking rate for large office developments of 3.17 parking spaces per 1,000 sq. ft. As stated above, this parking reduction is considered appropriate due to the location of the project site and the implementation of the other proposed TDM measures and is considered a trip reduction measure in and of itself.
9. **Carsharing:** In cooperation with the planned Station Park Green across the street from the development, the applicant will implement and, if needed, subsidize a carsharing program through an existing carshare provider. By offering this service in cooperation with Station Park Green (and also having the cars be available to the public), there will be a larger pool of potential users, which will help ensure the program's viability. To maximize usage, carsharing memberships could be provided free of charge to all employees, and marketing information could be distributed as part of new employee "welcome packs". Based on experiences in other locations, the introduction of a carsharing service could reduce the total daily vehicle trips by as much as 5-10%. However, since San Mateo does not currently have any carsharing vehicles, we have conservatively estimated the effect on trip reduction to be 2% at the site.
10. **Shuttle Participation:** Planned Station Park Green is proposing a shuttle service between its development and the San Mateo Caltrain station, which is one of Caltrain's limited stops (faster trains to San Francisco and San Jose). The applicant of 92/Delaware will participate in and contribute financially to this shuttle service. The shuttle will run every 20 minutes from 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM on weekdays. During weekends, when all trains stop at the Hayward Park station, the shuttle will not run. It is conservatively estimated that this service will reduce vehicle trip generation by 2%.

**11. Flexible Work Hours/Telecommuting:** There are several ways of arranging flexible work hours, for example flextime, compressed work week or staggered shifts. These different strategies all allow or force employees to start and/or leave work outside of peak hours. In addition telecommuting allows employees to work from home, thereby entirely eliminating some trips. All these measures reduce peak period congestion. It has been found that compressed workweeks alone can reduce automobile commute by 7-10%. Other research shows that flextime and telecommuting together can reduce peak hour vehicle commute trips by 20-50%. The applicant will ensure that employers provide the options of flexible work hours and telecommuting to as many employees as possible. It is conservatively estimated that telecommuting and fewer days in the office will reduce project trip generation by 4%.

## Optional TDM Program

The following strategy is not part of the proposed trip reduction program, but could become a valid option in the future.

## Caltrain GO Pass Program

Caltrain currently has an eco-pass program called GO Pass, in which participating employers purchase annual passes for all their full-time employees at a current cost of \$140 per person, which is 7-10% of the regular cost if buying monthly passes to San Jose and San Francisco, respectively.<sup>1</sup> The GO Pass is good for travel on Caltrain all week and between all zones.

If feasible, Hines could potentially build the cost of the program into the operating costs and offer tenants the ability to participate in the program during the tenant's lease term. Nelson\Nygaard's Trip Generation Analysis

## Project Trip Generation Assuming Average ITE Trip Generation Rates

To estimate the effect on trip generation of instituting a comprehensive transportation demand management program, we began by estimating the number of vehicle trips that would be generated by the project, assuming that the land uses in the project would produce the number of trips predicted by the weighted average trip rates shown in the Institute for Transportation Engineers (ITE) *Trip Generation* manual. The results of this analysis are shown in Figure 1.

**Figure 1 ITE Trip Generation**

Land Use	Unit Type	No. Units	Weekday Trip Rate			Total Trips (rounded)		
			Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
General Office	Trips/1,000 sq. ft.	325	11.01	1.55	1.49	3,578	504	484

## URBEMIS Project Trip Generation

After the trip generation for the project, as predicted by average trip generation rates from the ITE *Trip Generation* manual, was determined, it was then adjusted using the URBEMIS software model, which takes into account other variables that affect vehicle trip generation, including residential and

employment density, mix of uses, the presence of local serving retail, amount and cost of parking, transit, pedestrian and bicycle facilities, and some transportation demand management programs.

URBEMIS is a program developed for the California Air Resources Board to calculate emissions resulting from new developments. This program is an industry standard air emissions calculator for CEQA documents and is also used in calculating trip generation rates. It is useful to contrast the results of the URBEMIS model with the trip generation results obtained by simply using average trip generation rates taken from the ITE *Trip Generation* manual. The ITE average trip generation rates are based on observations made at single-use sites in suburban locations with free parking, little or no transit service and no transportation demand management programs. The URBEMIS model is designed to offer a useful comparison of the difference in trip generation that can be expected when locating high density development in mixed-use high-density areas with alternative transportation modes available and transportation demand management programs in place.

The URBEMIS mitigation component is a simple yet powerful tool; it employs standard traffic engineering methodologies, but provides the opportunity to adjust ITE average rates to quantify the impact of a development's location, physical characteristics and any demand management programs. In this way, it provides an opportunity to fairly evaluate developments that minimize their transportation impact, for example, through locating close to transit or providing high densities and a mix of uses.

### **Area Inputs**

In addition to requiring the transportation modeler to input the basic land use components of the proposed project (i.e. the number of square feet of each land use), URBEMIS also factors in other area-specific characteristics to determine accurate trip rates. The number of trips generated by a development depends not only on the characteristics of the project itself, but also on the nature of the surrounding area. For example, neighborhood characteristics such as a good balance of housing and jobs, the presence of frequent transit service, and a highly-connected, walkable street network are strongly associated with lower vehicle trip rates. High-density housing added to an existing central city neighborhood, where many shops, services and transit lines already exist, will normally generate fewer trips than the same housing located close to a freeway interchange and surrounded by only low-density housing subdivisions. For this reason, URBEMIS requires data about the area within approximately a half-mile radius from the center of the project; or for the entire project area, whichever is larger. Essentially, the smaller the development, the more important the role the development's context plays. Figure 2 shows the inputs that have been used to complete the URBEMIS mitigation component, along with data sources.

**Figure 2 URBEMIS Data Input**

Factor	Input Value	Source
Office	325,000 square feet	Project plan
Housing units in development	0	Project plan
Project Acreage	3.4 acres	Project plan
Net residential density (1)	Not applicable	Project plan
Below-market-rate units within development	Not applicable	Project plan
Number of housing units within ½ mile radius	2,746	Census data (2000)
Number of jobs located within ½ mile radius	6,630	Census Transportation Planning Package (2000)
Local serving retail within ½ mile radius	Yes	Site observation
Transit service	68 daily buses stop within ¼ mile (existing) 37 daily trains stop within ½ mile (existing)	Caltrain/Samtrans maps/schedules
Intersection density (2) within ½ mile radius	374 valences	Street plan
Sidewalk completeness within ½ mile radius	75% have sidewalk on both sides	Site observation
Bike lane completeness within ½ mile radius	25% direct parallel routes exist	Site observation

Notes:

(1) Net residential data excludes land not devoted to residential uses, prorating mixed-use sites by the percentage square footage of each use.

(2) Calculated from existing street network, based on the number line segment terminations, or each "valence". Intersections have a valence of 3 or higher - a valence of 3 is a "T" intersection, 4 is a four-way intersection, and so on.

Taking all of the above mentioned factors into consideration, the URBEMIS model results in a trip reduction of up to 14 percent (see Figure 3). There is currently a good mix of uses around the development with locally serving retail. These factors yield an eight percent trip reduction compared to standard ITE trip generation rate. Transit services yield another three percent trip reduction. Pedestrian and bicycle friendliness further reduce trip generation another three percent.

**Figure 3 Mitigated Trip Generation with URBEMIS**

Mitigation Step (1):	Number of trips Generated	% of Step 0
0. Assuming Standard ITE Trip Generation	3,578	100%
1. Residential Density and Mix of Uses	3,357	94%
2. Local Serving Retail, including Step 1	3,285	92%
3. Transit Service, including Steps 1-2	3,200	89%
4. Pedestrian/Bicycle Friendliness, including Steps 1-3	3,071	86%

## Cumulative Impact on Trip Generation

The following section evaluates the potential trip reduction resulting from the implementation of the Transportation Demand Measures (TDM) described above in comparison to the baseline number of daily vehicle trips (Figure 4). By taking the ITE trip rates and applying the projected TDM program trip reduction rates, we find that the project has excellent potential for TDM-related trip reduction.

**Figure 4 URBEMIS Mitigated Trip Generation with TDM**

Baseline Daily Trips	% Trip Reduction	% Trip Generation Compared to ITE	Vehicular Trips	Vehicular Trips w/ Increased Transit?
ITE Generated Trips	-	100%	3,578	3,578
URBEMIS Baseline Trips	14%	86%	3,071	3,038
<b>Currently Proposed TDM Measures</b>				
<ul style="list-style-type: none"> <li>• Bike Parking/Storage</li> <li>• Guaranteed Ride Home</li> <li>• Transportation Information</li> <li>• Shower/Changing Facility</li> <li>• Preferential parking for carpools/vanpools</li> <li>• Carpool matching program</li> <li>• Employee transportation coordinator</li> <li>• TMA participation</li> <li>• Shuttle</li> <li>• Carsharing</li> <li>• Flexible Work Hours/Telecommuting</li> </ul>	11%	75%	2,678	2,645

Using the URBEMIS model we can see that the location of the proposed project, the presence of transit services and locally serving retail, as well as existing pedestrian and bicycle conditions result in a 14% percent decrease in the number of daily vehicle trips. We can also anticipate an additional 11% decrease in daily vehicle trips from the ITE generated trips if we employ the TDM measures currently proposed by the developer.

## Conclusions

There are positive as well as negative elements that need to be taken into account when considering the process of minimizing solo-occupant commuting to and from the proposed project site. On the positive side, it is essentially adjacent to the Hayward Park Caltrain station, is served by Samtrans bus line 292 and other bus routes within a 10-minute walk, and will be located adjacent to the large mixed-use development Station Park Green. Negatively, pedestrian access (for either walkers or transit users) and bicycling conditions are poor as a result of the Highway 92 access roads that wrap around the two buildings and the projects' close proximity to both Highway 92 and 101, which encourage solo driving. With a TDM program that includes the following measures there will be at least a 25% trip reduction in the long-term scenario:

- Bicycle storage/parking
- Shower/changing facilities
- Guaranteed Ride Home program
- Information on transportation alternatives
- Carpool matching program
- Preferential parking for carpools/vanpools
- Employee transportation coordinator

- Transportation Management Agency (TMA) participation
- Parking reduction
- Carsharing
- Shuttle participation
- Flexible work hours/telecommuting
- Option to participate in the Caltrain GO Pass program

With a 25% reduction in automobile trips, a reduction in parking demand can be expected as well. For an office development, there is a fairly strong correlation between trip generation and parking demand, since the employees either drive, carpool or access the site by other means than in a car. Assuming that there are on average 1.2 employees per vehicle (accounting for some carpooling), a 25% trip reduction results in more than 20% parking demand reduction. However, to be conservative, and to include parking demand for visitors and services, it is estimated that the TDM program for this development will result in at least a 10% parking reduction.

It should also be noted that the somewhat reduced availability of parking planned for the development compared to the City's code requirement for large office developments is in fact a strength that will help ensure the success of the TDM program. A recent study by the Transportation Research Board<sup>3</sup> found that ample parking makes it hard for commuter programs to be effective and that there is a strong correlation between successful TDM programs and limited parking availability. At sites with reduced parking, building tenants and employees find creative ways to reduce drive alone trips, and show significant reductions in parking demand, regardless of location.