Dos Pueblos High School Transportation Study

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On behalf of the DPHS Traffic/Safety Committee and the Coalition for Sustainable Transportation (COAST)

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Executive summary

- DPHS students are widely dispersed; the median distance students travel to school is 2.5 miles.
- 20% of the students live within 1.5 miles of school, and can reasonably walk or bike. If there were a freeway overpass in western Goleta, that figure would double to 40%.
- More than half of the students live within 1/3 mile of a bus stop, and can reasonably take the bus to school in time for their first period class.
- There is sufficient population density to support carpooling arrangements. Almost 70% of the students live within 1/4 mile of at least 20 other DPHS students.
- 75% of DPHS students get to school by car.
- 20–40% of those driving participate in carpools.
- Over 40% of those driving do so by choice, i.e., drive in spite of the availability of alternative transportation options; the rest drive by necessity.

Introduction

The car traffic around Dos Pueblos High School (DPHS) has long been a source of concern. Though the daily traffic jams are brief, occurring for the most part just 15 minutes before the start of school and again in the afternoon, drivers find it annoying to have to creep for several blocks before entering the drop-off zone in the parking lot. More significantly, the number of cars passing through the school zone adds a safety concern to those students walking and biking to school, and generally discourages walking and biking by making it unpleasant if not uncomfortable. From an environmental perspective, such reliance on personal vehicles adds to local air pollution and global carbon emissions. And neighbors around the school have reportedly complained about traffic and street parking by students.

The DPHS Traffic/Safety Committee has attempted to address the traffic situation in two ways. First, for the first week of each school year the committee organizes volunteers to guide traffic flow, thereby setting a pattern for the rest of the school year. Though this

activity does not lessen traffic in any way, by making traffic flow more uniform and predictable the safety of pedestrians is enhanced.

Second, and more to the point of reducing traffic, in January 2012 the committee worked with the Community Environmental Council[1] and Traffic Solutions[2] to put on a week-long carpool promotion. The event was widely publicized and by all accounts was a success, drawing much participation from the student body (who were motivated by free donuts and raffle prizes) and causing a noticeable decline in the number of cars parked in the parking lot that week. But the event has not been repeated since then, and with no before and after measurements, it is difficult to gauge if there have been any lasting effects.

As part of that carpool promotion Traffic Solutions set up an online registry, both to track participants in the event and to facilitate finding carpool partners. However, due to funding limitations the registry did not incorporate Traffic Solutions' sophisticated carpool matching system, which utilizes geographic proximity and other factors, but instead was implemented as a simple, unordered list of names and contact information. The registry fell into disuse after the first year, and at this point has been removed from the school website.

Figure 1. Cars on the left, bikes on the right.

[1] http://www.cecsb.org/
[2] http://www.trafficsolutions.info/

The purpose of this study is to step back and assess the situation at DPHS: where students are coming from, which transportation options are available to whom, and to what extent students (and parents) are choosing to drive even though alternative transportation options are available.

Two sources of data were used in the study. First, to understand the geography of the student body, a list of 2,131 addresses representing student home locations[3] was obtained from the school. Because the student population changes every year, both in distribution and in absolute size, the list should be taken as representative in its broad characteristics only. Second, to understand current behavior, the DPHS students surveyed themselves on the primary mode of transportation they use to get to school.

The author would like to thank DPHS leadership students Collin Dutter and Tyler Bradford, and the rest of the student leaders, for their help in carrying out the survey. Thanks, too, to the DPHS administration team for their support of this project.

Student distribution

The geographic distribution of DPHS students is quite large (Figure 2, next page). Taking advantage of the school district's open enrollment policy, and presumably drawing on its academic reputation, DPHS attracts students from Montecito to the east all the way to Dos Pueblos Ranch up the Gaviota coast to the west, and from the Mesa to the south to Painted Cave to the north.

[3] The list is from a previous school year. A handful of addresses that could not be geolocated (post office boxes, etc.) were discarded. A handful of the remaining addresses appear to be work addresses, not home addresses; they were retained regardless.

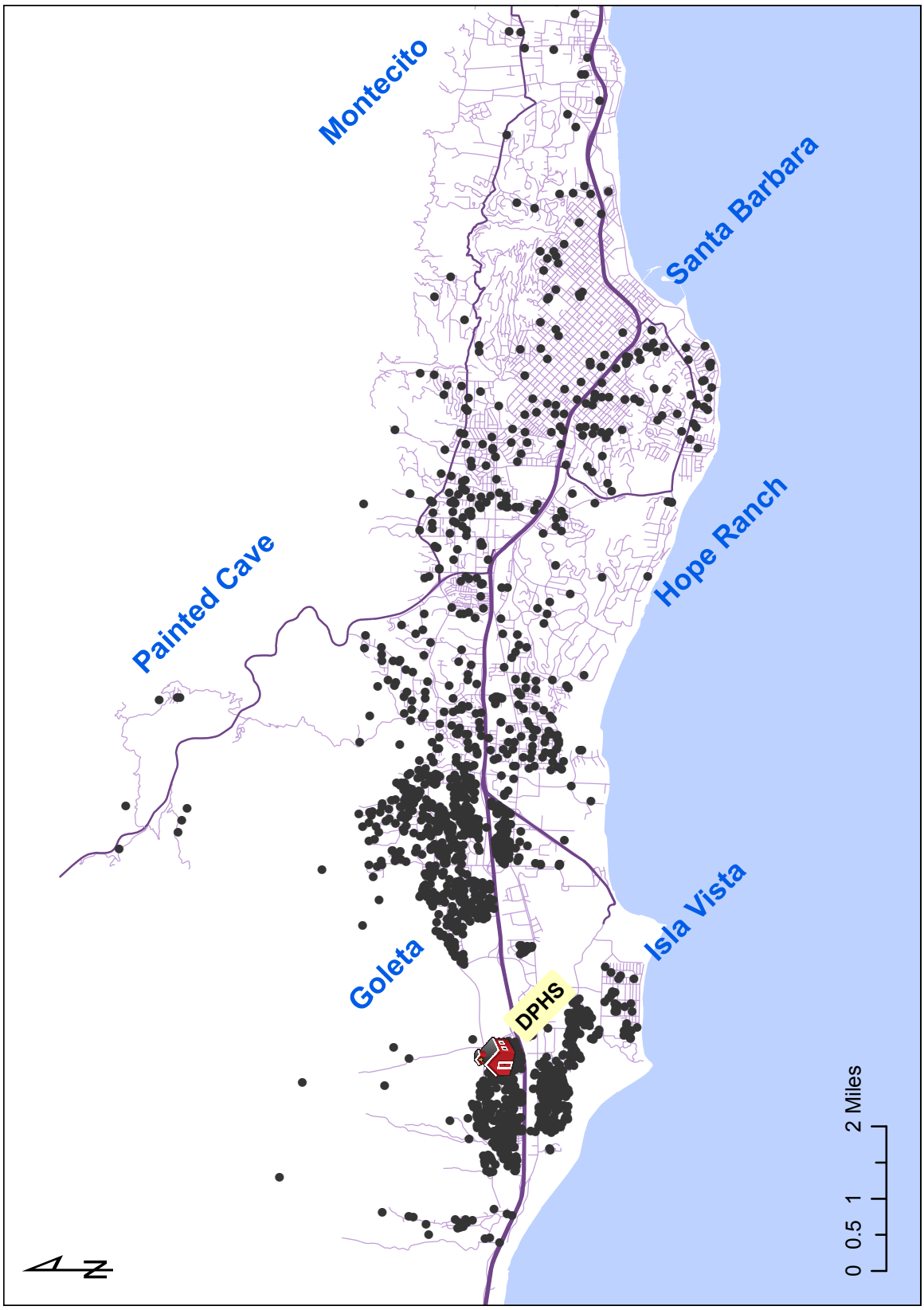

Figure 2. Geographic distribution of DPHS students.

More remarkable than the raw extent of the student distribution is what we might call its spread, that is, the degree to which students are concentrated not just in the immediate vicinity of the school, but far away as well. The spread can be appreciated by comparing DPHS with another school in the area such as La Patera Elementary (Figure 3, below). Though La Patera's student distribution is large by elementary school standards, nevertheless 99% of its students live within 2 miles of the school, and the median distance La Patera students travel to school is 1.1 miles. By contrast, **the median distance DPHS students travel to school is 2.5 miles**.[4] Such a large median distance means that walking and biking to school are not options for many DPHS students, thus putting increased emphasis and reliance on busing and carpools.

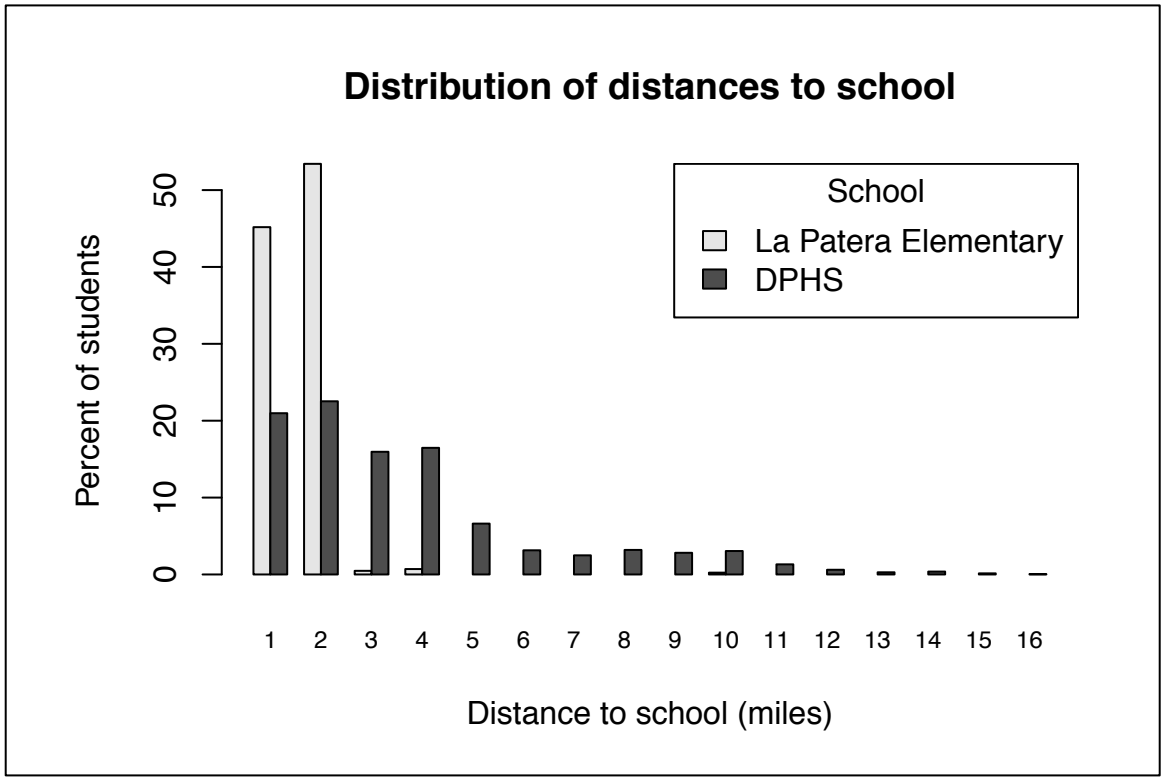

Figure 3. Comparison of DPHS travel distances to those of a nearby elementary school.

Walking and biking

The neighborhood immediately to the west of DPHS consists of quiet residential streets bordered by Cathedral Oaks to the north and Calle Real to the south. Cathedral Oaks in that area has Class II bike lanes and less traffic than most other stretches of Cathedral Oaks. Footpaths and sidewalks through the open space in the middle of the neighborhood provide a shortcut and a means of avoiding the busier and higher-speed

[4] For simplicity, all distances in this study are Euclidean (straight line). Actual travel distances are longer. For this reason, threshold distances (e.g., the maximum distance considered reasonably bikeable) have been reduced.

sections of Calle Real. The topography is flat. All this adds up to an area that is eminently walkable and bikeable.

If we define the maximum reasonable bicycling distance to be 1.5 miles—at 10mph, a distance that is traversed in 9 minutes—we can see that the neighborhood as far west as Winchester Canyon is bikeable (Figure 4, below). 400 students live in this region, which is to say, **20% of DPHS students can reasonably bike or walk to school**.

Within the same 1.5 mile radius of school, but south of the freeway and Hollister, live another 400 students. Unfortunately, there is no good access to school via bike for these students: going around Winchester Canyon is too much of a detour, and riding through the Storke/Hollister and Storke/freeway interchanges twice a day on a daily basis would be considered too risky by all but the hardiest riders. A freeway overpass in western Goleta has been discussed for many years now, and is in the City of Goleta's General

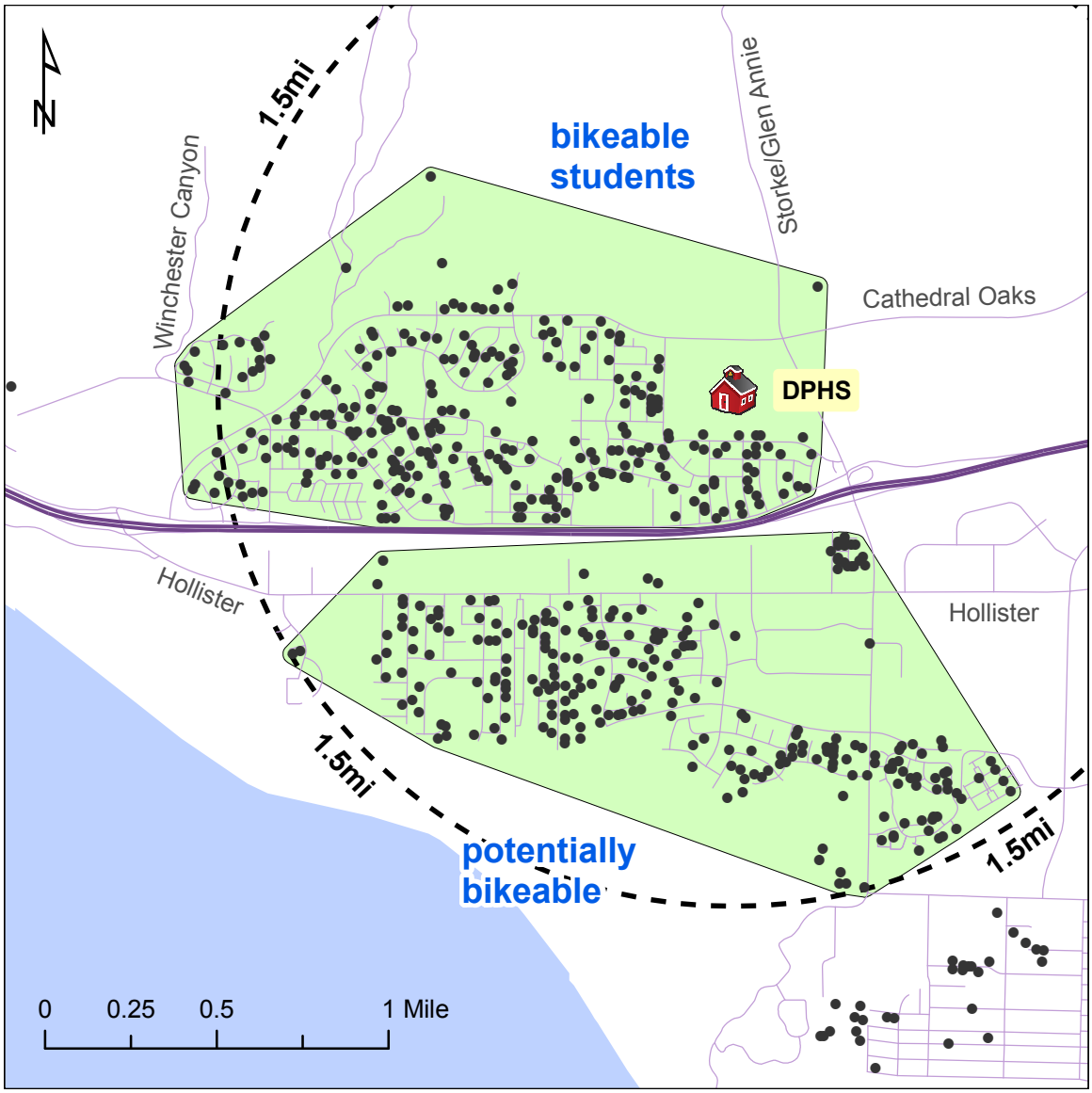

Figure 4. Students living within bikeable distance of school.

Plan and Capital Improvement Program[5]; if it existed, the bikeable area would be doubled, i.e., 40% of DPHS students could bike to school.

Bus service

MTD[6] operates three general-purpose bus lines that service DPHS (lines 10, 23, and 25) and four dedicated "booster" buses (2710, 2720, 2730, and 2740).

Our criterion for the availability of bus service is based on the distance to the nearest stop on one of the above bus lines. To take into account the additional time a bus rider must budget to ensure not missing the bus, we use a relatively small value for the maximum reasonable walking distance to a bus stop: 1/3 mile, the equivalent of three State Street blocks and 7 minutes at a casual walking pace. With this low threshold, close to two-thirds (64%) of students can take a bus to school.

However, it must be noted that, with one exception, MTD buses arrive at school only in time for first period (8:00am), not zero period (7:00am). At present 16% of DPHS students have a zero period, and so the above percentage of busable students must be reduced accordingly. We conclude that **more than half (54%) of DPHS students live within 1/3 mile of a bus stop, and can reasonably take a bus to school in time for their first period class**.

If the threshold distance is increased to 1/2 mile (the equivalent of 5 State Street blocks), the percentage of busable students rises to 67%, or two-thirds. Referring to Figure 5 (next page), bus service is lacking in the north Goleta neighborhoods between Patterson and La Patera. Over 200 students live in this area, and if MTD were to provide service (while still keeping the 1/3 mile threshold), the percentage of busable students would rise similarly.

[5] http://projectgoleta.com/on-the-horizon/101-overpass-project/
[6] http://www.sbmtd.gov/

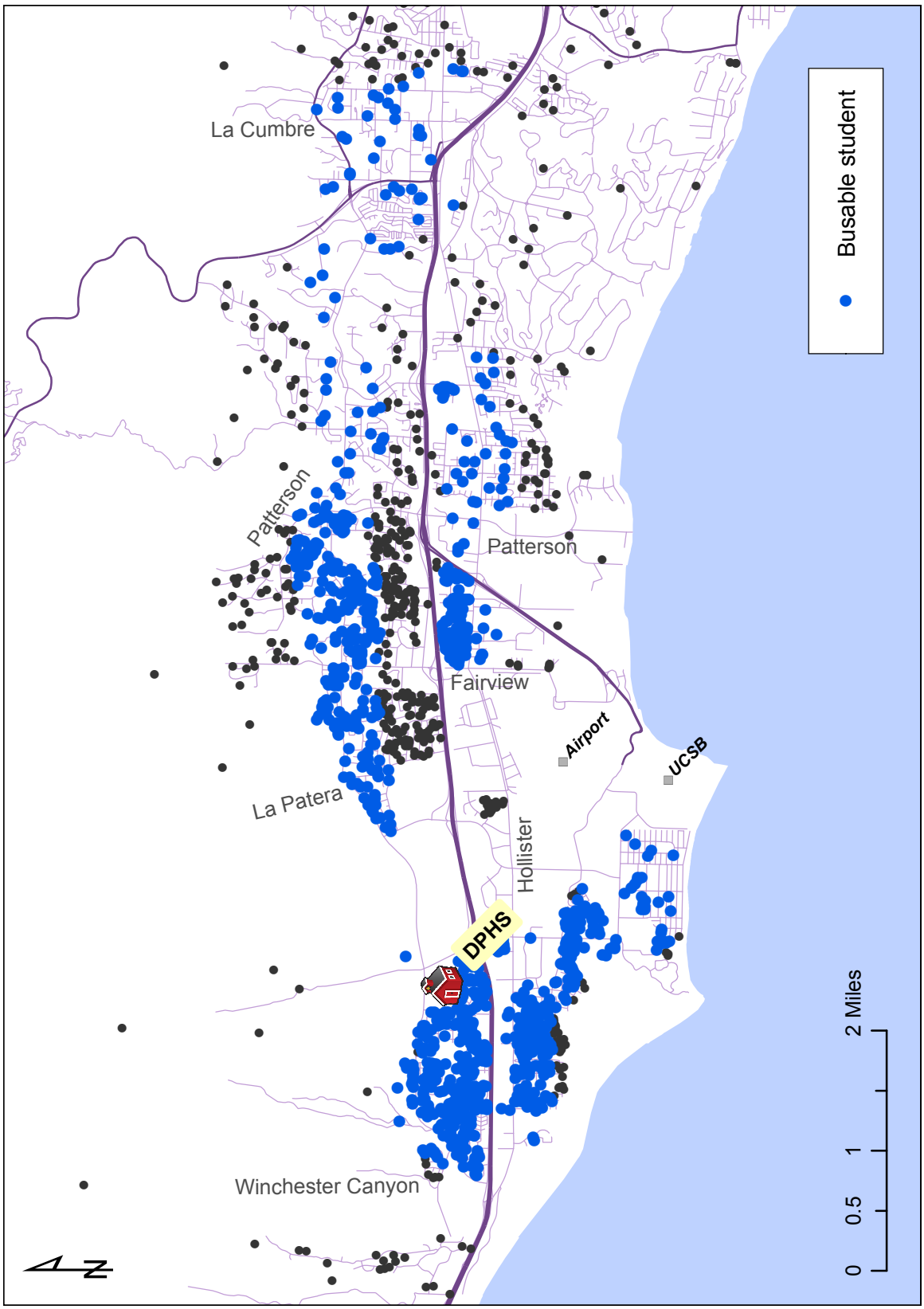

Figure 5. Students living within 1/3 mile of a bus stop.

Carpooling

Establishing a regular carpool arrangement is not easy. First there are the preconditions of living in the same proximate area, having similar schedules, and having sufficient space in one's car. Then there is the ultimate condition of trust. The parent of the riding student must trust the parent doing the driving, generally meaning that the parents must be familiar with each other if not friends to some degree. Similarly, in the case of a student being driven by another student, any carpool arrangement is likely to grow out of friendship.

But while proximity by itself is no guarantee of a successful carpool arrangement, geographic proximity generally determines the pool of candidate carpool members, and a measure of student proximity and density can indicate where carpools may be formed and the likelihood of their formation. Furthermore, the proximity precondition is doubly important because in many cases it correlates with trust. High school students living close together often attended the same elementary school, and it is at elementary school that parents are more likely to play a greater role in the school, to take part in more school activities, and therefore to have more opportunities for meeting other parents. Thus, students living close to each other are more likely to have parents that know each other, thus facilitating carpooling.

The proximity precondition for arranging carpools is met by the majority of DPHS students. As can be seen in Figure 6 (next page), **almost 70% of DPHS students live within 1/4 mile of at least 20 other DPHS students** (probabilistically, that's at least 5 other DPHS students in their grade). And there are regions of even higher density. Nearly 40% of students live within 1/4 mile of at least 50 other students, and in a couple notable areas (Old Town Goleta and Ellwood), students live within 1/4 mile of more than 100 other students. Given these densities, it should be possible for many carpool arrangements to be formed.

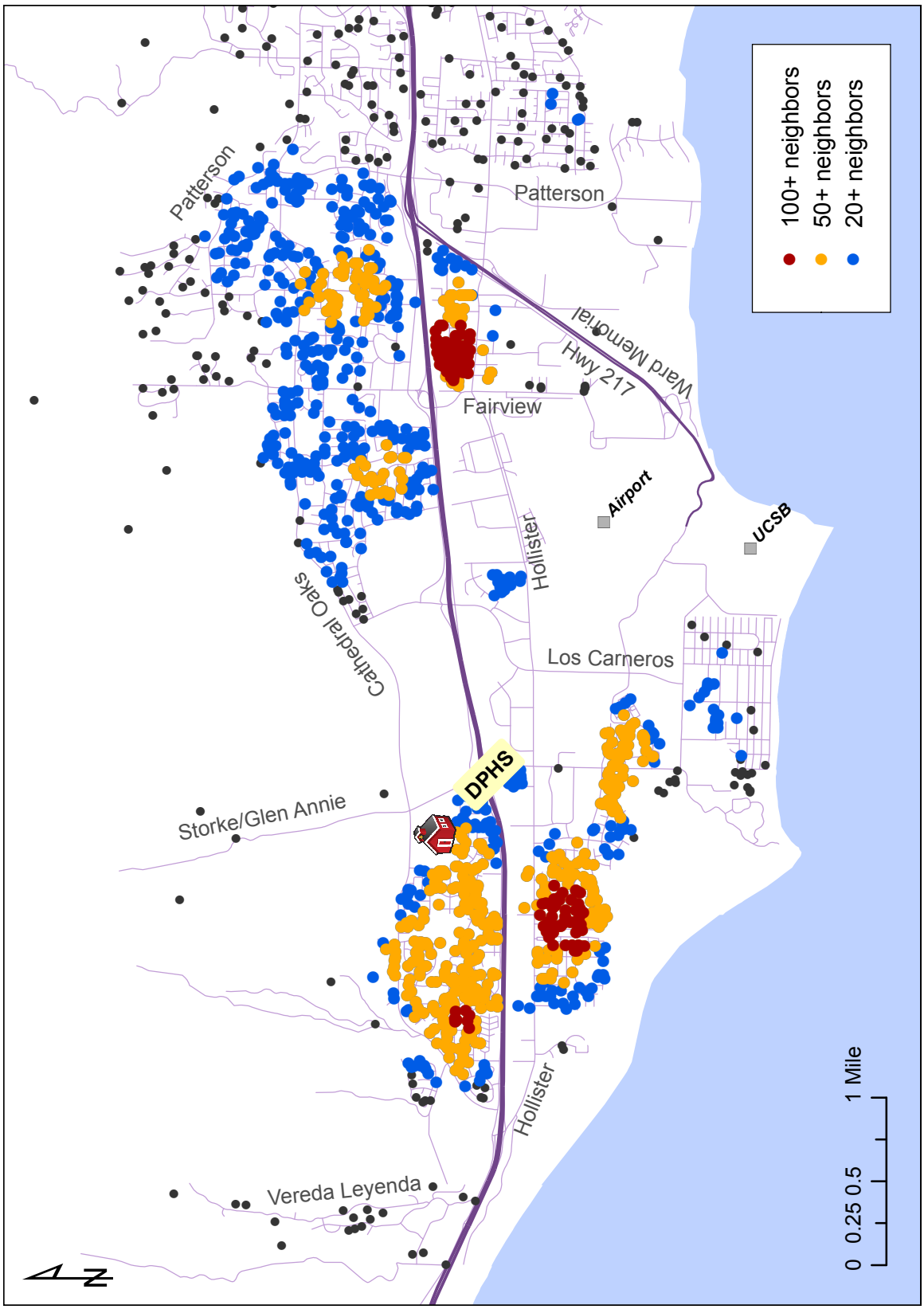

Figure 6. Density of students expressed as the number of other students living within 1/4 mile.

Student survey

The DPHS students surveyed themselves regarding their primary mode of transportation to school, the choice of modes being:

- self-drive
- parent-driven
- carpool
- bus
- bike
- walk

Additionally, the survey asked if students use two or more of these modes on a regular basis.

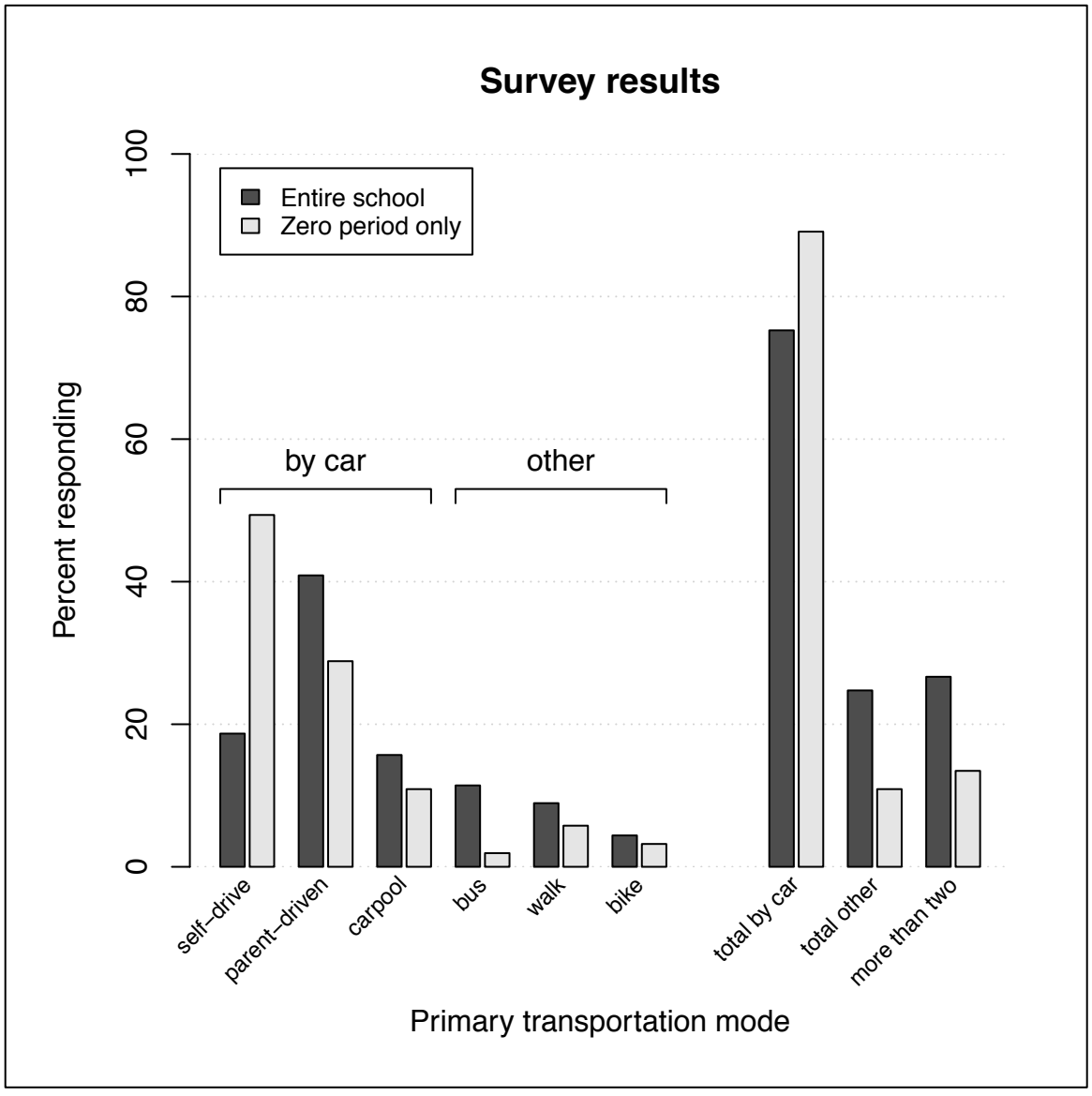

Figure 7. Survey results.

The transportation choices are different for students with a 7:00am zero period because of the aforementioned lack of bus service, the fact that it is still dark at that time for part of the year, and the generally earlier hour. Thus two surveys were performed, the first during 4th period with the intention of capturing the entire school, and a second taken during zero period. The response rates to the surveys were 73% and 45%, respectively.

The results (Figure 7, previous page) show that **75% of DPHS students get to school by car**, a figure that rises to 90% for zero period students. 12% get to school by bus and 13% by biking and walking.

Interestingly, the "self-drive" rate for zero period is more than twice as high as that for the overall school, and the percentages for "parent-driven" and "carpool" are correspondingly lower. There are three likely explanations for this result: first, zero period classes are largely only available to older students; second, parents may be unwilling to shuttle their child to school at that early hour if their child can drive themselves; and third, by law, first-year drivers are not allowed to carry passengers.

Of those students getting to school by car, what percentage participate in carpools? The raw value is 20%, but the actual percentage is a little difficult to determine because of a flaw in the survey procedure. The survey was administrated orally by a show of hands. In at least some classrooms students were not given a preview of all the choices before responding; rather, choices were announced in the order on the survey sheet, which is the order given above, with students responding immediately. It is possible, if not likely, that a student participating in a carpool but being the driver of the car or being driven by one's own parent would respond with "self-drive" or "parent-driven" before the "carpool" choice was announced. If we assume that every student who *did* respond with "carpool" is a guest in another car, then the raw percentage would be doubled. Thus, we conclude that **20–40% of students getting to school by car participate in carpools**. For zero period students the range is 12–24%.

Discussion and recommendations

Addressing the car traffic at DPHS is not easy because of the basic geographic situation: 80% of students live outside the bikeable region, and almost half the students have no readily accessible bus service. Nevertheless, there is clearly room for improvement. If we combine the bikeable students and busable students, then close to 60% of students have some form of alternative transportation available to them (Figure 8, next page). Contrast this figure with the current situation that 75% of students get to school by car. The implication is that, **of those students getting to school by car, over 40% do so by choice**, i.e., drive despite the availability of alternative modes of transportation.

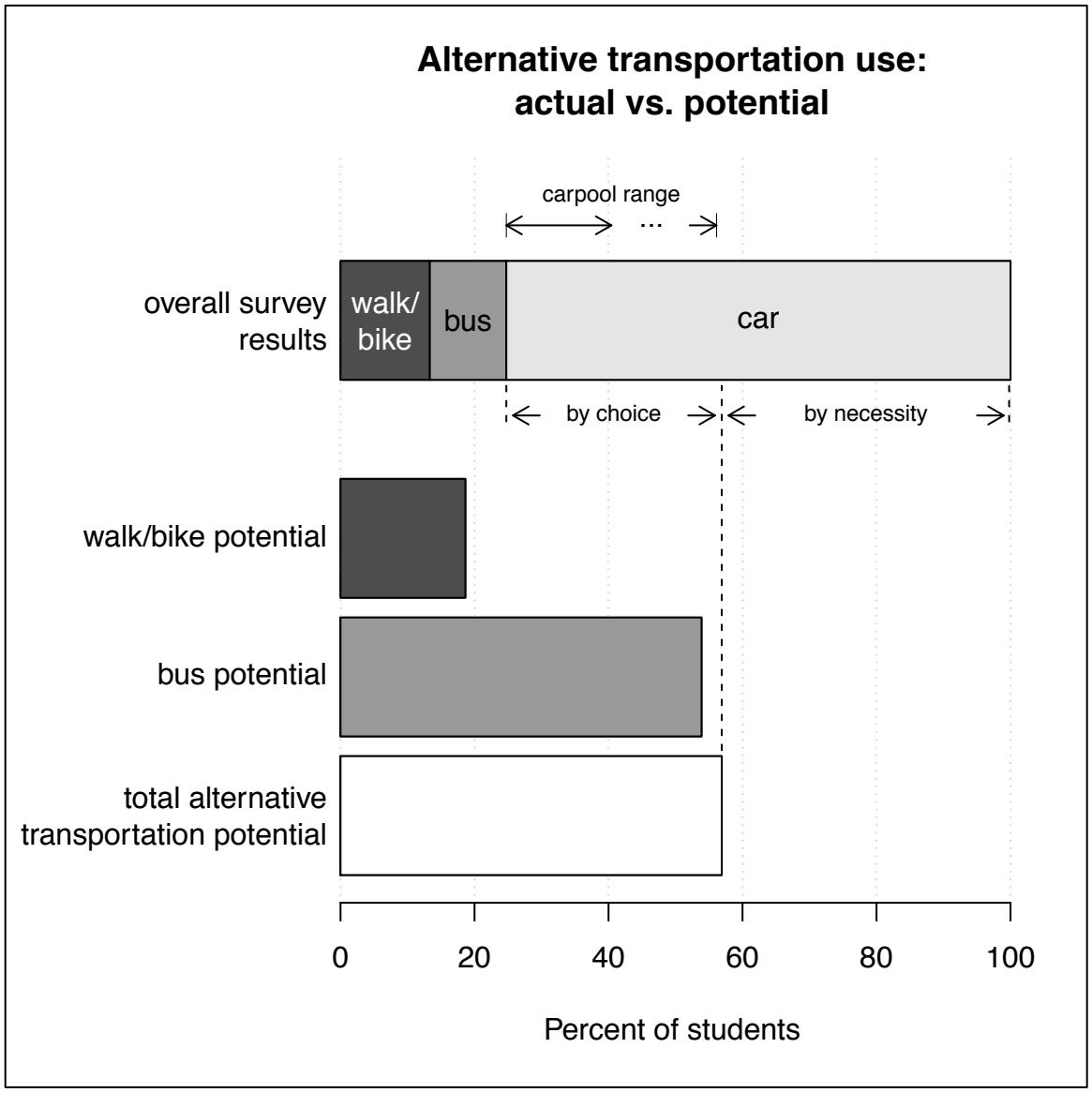

Figure 8. Comparison of actual and potential rates of alternative transportation use.

These statistics suggest two strategies for reducing car traffic that the school might pursue:

- Promote alternative transportation, particularly bus service. 20% of students could bike or walk to school, but only 13% are currently. Over half could take the bus, but only 12% are currently.
- Promote carpooling among those students who do drive. The carpooling rate is only 20–40%. And given that almost 60% of those driving do so by necessity, carpooling is perhaps the single most promising strategy for reducing car traffic.

Additional recommendations:

- *For the City of Goleta:* continue developing a freeway overpass in western Goleta. The overpass is needed for many reasons in the community, but for

DPHS specifically it would double the number of students who could bike to school.

- *For MTD:* consider improving bus service in northern Goleta, where there is currently no convenient bus service. Consider improving service for students with zero periods.
- *For Traffic Solutions:* implement a version of the proximity-based carpool matching system for DPHS (and presumably other high schools). Given the promise of carpooling, a matching system could be very successful.