

## **VI. PROJECT ACCESS**

This chapter evaluates the proposed access to the project site. Access to the south towards Old Davis Road will be provided on Dairy Road, Bioletti Way, or Dairy Road and Bioletti Way. The opportunities and constraints of providing access on Dairy Road and/or Bioletti Way were evaluated in consideration of necessary roadway improvements, traffic operations and feasible mitigation measures, and existing pedestrian and bicycle facilities. In addition, providing adequate access to the WEPS at the main driveway and secondary driveway was discussed.

### **Roadway Improvements**

The selected access roadway will be improved to include one northbound and one southbound travel lane, bicycle lanes or off-street bicycle paths, curbs, gutters, and sidewalks between Hutchison Drive and La Rue Road. Bioletti Way currently has the above features. However, the existing gate prohibiting through traffic between Hutchison Drive and La Rue Road would need to be removed. Dairy Road would need substantial improvements including widening to accommodate a minimum of 11-foot travel lanes, on-street bicycle lanes, curbs, gutters, and sidewalks.

### **Traffic Operations**

The La Rue/Dairy Road and La Rue Road/Bioletti Way intersections will operate acceptably under each access scenario for existing and Year 2005 conditions with the construction of the WEPS. However, vehicles traveling southbound on Dairy Road or Bioletti Way and turning left onto La Rue Road would experience unacceptable delays (LOS E or worse) during the peak hours.

Both intersections could be improved by providing exclusive left and right-turns lanes on the southbound approach. However, limited right-of-way is available at the Bioletti Way/La Rue Road intersection and widening the southbound approach would likely impact the trees in the two northern quadrants of the intersection. Constructing a roundabout at this intersection would also impact these trees.

Due to the undeveloped land on the northwest quadrant of the La Rue Road/Dairy Road intersection, adequate right-of-way is available to provide exclusive left and right-turns lanes on the southbound approach. The existing turn lane on La Rue Road serving Garrod Drive could also be extended to provide a center left-turn lane for vehicles entering Dairy Road. In

addition, the intersection would operate acceptably with the construction of a roundabout and adequate right-of-way is available (impacts of roundabout were identified in Chapter V).

### **Pedestrian and Bicycle Facilities**

Off-street bicycle paths are located in the vicinity of Dairy Road and Bioletti Way. The Tercero Hall bicycle path is just west of Bioletti Way and serves the Tercero student housing complex. An east-west bicycle path crosses both Dairy Road and Bioletti Way and provides access between the Health Sciences District and the central campus.

Although the majority of bicycle and pedestrian activity occurs along Bioletti Way, future student housing on the west side of Dairy Road will increase the number of bicyclists and pedestrians traveling on Dairy Road. Consequently, both roadways will serve a high volume of students biking and walking to/from the central campus.

### **Conclusion**

Although providing southern access on Dairy Road would require more improvements than Bioletti Way, Dairy Road would offer the following advantages:

- Dairy Road would provide direct access to the main WEPS driveway and would reduce the number of vehicles traveling on Hutchison Drive between Dairy Road and Bioletti Way;
- Widening Dairy Road would help accommodate the anticipated increase in vehicle and bicycle traffic generated by future campus growth;
- Providing bicycle lanes on Dairy Road would help to serve the planned student housing complex located on the west side of Dairy Road; and
- The undeveloped land on the west side of Dairy Road makes widening the roadway feasible at this time.

### **Project Driveways**

The WEPS will be served by the main driveway opposite of Dairy Road and a secondary driveway providing access onto Kleiber Hall Drive. Both of the project driveways will provide one inbound and one outbound travel lane.

Restricting vehicles exiting the main WEPS driveway to right-turns only onto Hutchison Drive and installing a traffic signal at the Hutchison Drive/Dairy Road intersection will provide acceptable operations at this intersection with the implementation of the WEPS. However, the distribution of traffic between the main driveway and the secondary driveway will change if access is restricted at the main WEPS driveway. The distribution of vehicles using each driveway is summarized below assuming Dairy Road provides access to/from the south.

- If full access is provided to/from the main WEPS driveway at Dairy Road and Hutchison Drive, approximately 80 percent of vehicles will use the main driveway and 20 percent of vehicles will use the secondary driveway.
- If access is restricted to right-turns only on the southbound approach of the main WEPS driveway, approximately 75 percent of vehicles will use the main driveway and 25 percent of vehicles will use the secondary driveway.

The Hutchison Drive/Kleiber Hall Drive intersection will be able to accommodate the additional traffic utilizing the secondary driveway if access is restricted at the main driveway. If access is restricted at the main WEPS driveway, signs will need to be posted within the garage to direct vehicles traveling to the south (i.e., on Dairy Road) to the secondary driveway.

## **VII. PEDESTRIANS AND BICYCLISTS AT UNSIGNALIZED INTERSECTIONS**

Hutchison Drive and the adjacent bicycle paths serve many bicyclists and pedestrian traveling to the Central Campus. Therefore, the Hutchison Drive/Dairy Road and Hutchison Drive/Kleiber Hall Drive intersections were analyzed with the addition of bicyclists and pedestrians to determine a more realistic result of the traffic operations with the construction of the WEPS. The methodology, results, and recommendations are discussed below.

### **Methodology**

The *2000 HCM* methodology does not include the effects of bicyclists and pedestrians on unsignalized intersections. Given the relatively large amount of bicycle and pedestrian traffic along Hutchison Drive, a methodology was developed to determine the effects of bicyclists and pedestrians at unsignalized intersection. A micro-simulation analysis was required to conduct a detailed analysis of bicycles and pedestrians at unsignalized intersections to determine the resulting vehicle delay and LOS results. The VISSIM micro-simulation software program was used to evaluate vehicle, bicycle, and pedestrian traffic flows at the Hutchison Drive/Dairy Road and Hutchison Drive/Kleiber Hall Drive intersections. Intersections were analyzed under Year 2005 conditions during the a.m. and p.m. peak hours with the implementation of the WEPS assuming southern access was provided on Dairy Road.

### **Bicycle and Pedestrian Travel**

Bicycle counts were conducted in Fall 2001 at the Hutchison Drive/Kleiber Hall Drive intersection. These counts were used to develop bicycle volumes at the Hutchison Drive/Dairy Road intersection. Bicyclists were assumed to travel on the proposed on-street bicycle lanes on Hutchison Drive and Dairy Road<sup>10</sup>. The number of bicyclists traveling on Dairy Road and crossing Hutchison Drive to access the north-south bicycle path were estimated based on the existing volume of bicyclists on Hutchison Drive and the planned student housing on the west side of Dairy Road. The number of bicyclists traveling through the two study intersections is summarized below.

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10 The existing bicycle path on the north side of Hutchison Drive will continue to serve bicyclists traveling westbound from the Central Campus. Therefore, the path will need to be realigned to cross these intersections at the crosswalks. Please note that the vehicle delay contributed by westbound bicyclists would be the same if bicyclists used an on-street bicycle lanes or the realigned bicycle path.

- Approximately 80 bicyclists during the a.m. peak hour and 60 bicyclists during the p.m. peak hour will travel through the two study intersections towards the central campus (eastbound);
- Approximately 45 bicyclists during the a.m. peak hour and 80 bicyclists during the p.m. peak hour will travel from the central campus through the two study intersections (westbound); and
- Approximately 60 bicyclists during the a.m. peak hour and 70 bicyclists during the p.m. peak hour will cross Hutchison Drive at Dairy Road to travel between the on-street bicycle lanes on Dairy Road and the existing north-south bicycle paths serving the UC Davis Recreation Center.

The number of pedestrians crossing each of these intersections during the peak hours was not available. Therefore, pedestrian volumes and travel patterns were estimated based on the number of new pedestrians generated by the WEPS and the surrounding campus uses. The a.m. and p.m. peak hour vehicle trip generation rates were used to estimate the number of pedestrian trips generated by the WEPS. Twenty-five percent of pedestrians walking to/from the WEPS were assumed to travel through one of these study intersections.

Based on the above assumptions, 245 pedestrians during the a.m. peak hour and 200 pedestrians during the p.m. peak hour will travel through these study intersection. The majority of these trips (about 80 percent) will travel towards the central campus and about 20 percent will travel towards the south by crossing Hutchison Drive at Dairy Road or Kleiber Hall Drive.

## **Results**

If the Hutchison Drive/Dairy Road intersection provided full access and remained unsignalized (i.e., stop controlled on the northbound and southbound approaches), this intersection would operate at LOS F with and without the effects of bicyclists and pedestrians. However, if the northbound Dairy Road and southbound main WEPS driveway approaches were both restricted to right-turns only onto Hutchison Drive, the intersection would operate acceptably without the effects of bicyclists and pedestrians at the intersection.

Therefore, to measure the effects of bicyclists and pedestrians, the VISSIM analysis assumed that Dairy Road and the main WEPS driveway only allowed right-turns onto Hutchison Drive. The results of the VISSIM analysis are summarized below.

- Hutchison Drive/Dairy Road

*AM Peak Hour - Year 2005 Plus Project Conditions:* This intersection was reported to operate at LOS B based on the *2000 HCM*. Bicyclists and pedestrians would increase the average delay by approximately 30 seconds per vehicle resulting in LOS D operations at this intersection.

The following approaches are most impacted by bicyclists and pedestrians:

- The northbound approach and the westbound left-turn movement due to the large volume of eastbound bicyclists traveling on Hutchison Drive towards the central campus; and
- The eastbound left-turn movement from Hutchison Drive into the main WEPS driveway due to bicyclists traveling south from the existing bicycle path onto Dairy Road and bicyclists traveling westbound on Hutchison Drive from the central campus.

*PM Peak Hour - Year 2005 Plus Project Conditions:* This intersection was reported to operate at LOS B based on the *2000 HCM*. Bicyclists and pedestrians would increase the average delay by approximately 10 seconds per vehicle resulting in LOS C operations at this intersection. However, only 85 percent of the vehicles exiting the WEPS would be able to travel through the Hutchison Drive/Dairy Road intersection during the p.m. peak hour due to the additional delay caused by vehicles yielding to bicyclists and pedestrians. Specifically, approximately 300 vehicles would be able to exit the main WEPS driveway onto Hutchison Drive during the p.m. peak hour while the demand for this movement is 360 vehicles. Therefore, the estimated LOS results are better than would actually exist at this intersection.

- Hutchison Drive/Kleiber Hall Drive

*AM Peak Hour - Year 2005 Plus Project Conditions:* This intersection was reported to operate at LOS B based on the *2000 HCM*. Bicyclists and pedestrians would increase the average delay by approximately 80 seconds per vehicle resulting in LOS F operations at this intersection. The eastbound left-turn movement from Hutchison Drive onto Kleiber Hall Drive would experience the most impacts due to bicyclists and pedestrians crossing the north leg of the intersection.

*PM Peak Hour - Year 2005 Plus Project Conditions:* This intersection was reported to operate at LOS B based on the *2000 HCM*. Bicyclists and pedestrians would

increase the average delay by approximately 20 seconds per vehicle resulting in LOS D operations at this intersection. The southbound right-turn movement from Kleiber Hall Drive onto Hutchison Drive would experience the most impacts due to bicyclists and pedestrians crossing the north leg of the intersection.

### **Recommendations**

Although the results indicate that the Hutchison Drive/Dairy Road intersection would operate acceptably with the addition of bicyclists and pedestrians, leaving this intersection as unsignalized could create conflicts between vehicles, bicyclists, and pedestrians. The figure below displays one example of a conflict that could occur. As shown, a vehicle entering the main WEPS driveway is yielding to a pedestrian and three vehicles are stopped on Hutchison Drive blocking through traffic.



As discussed in Chapter V, installing a traffic signal at this intersection will improve traffic operations during both peak hours and will provide a protected crossing for bicyclists and pedestrians.

The Hutchison Drive/Kleiber Hall Drive intersection will operate unacceptably during the a.m. peak hour with the addition of bicyclists and pedestrians. The figure below displays an example of a vehicle traveling southbound on Kleiber Hall Drive and a vehicle making a left-turn from Hutchison Drive onto Kleiber Hall Drive both yielding to pedestrians crossing the north leg of the intersection.



Providing only right-turns from the main WEPS driveway and Dairy Road onto Hutchison Drive will force vehicles traveling south on Dairy Road to use the secondary access off Kleiber Hall Drive. Consequently, traffic volumes at this intersection will increase. Installing a traffic signal at the Hutchison Drive/Dairy Road intersection would allow vehicles to access the main WEPS driveway from Dairy Road. This would decrease the number of vehicles turning left from Hutchison Drive onto Kleiber Hall Drive and would decrease the average delay by approximately 20 seconds per vehicle. Although the Hutchison Drive/Kleiber Hall Drive intersection would continue to operate unacceptably (LOS F) during the a.m. peak hour, the decreased traffic volumes would improve operations.