Alternative Circulation Plans for the Rose Bowl Loop

Final Report

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by

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CHAPTER 1 -- INTRODUCTION

This report documents a study of alternative circulation plans for the Rose Bowl Loop, which consists of the roadways that encircle the Rose Bowl stadium and the Brookside Golf Course. The Loop is a heavily used recreational facility, serving as a route for walkers, joggers, skaters and bicyclists while also providing motorists with access to and about the Rose Bowl area. The City of Pasadena Department of Transportation and Department of Public Works has issued a contract to develop alternative circulation plans. In this report, the existing Loop roadway improvements are discussed in detail, along with a comprehensive evaluation of the various options available to retain and upgrade the recreational opportunities that can be provided for both pedestrians and cyclists.

Background

The history and tradition of the New Year’s Rose Bowl football game continue to make the Rose Bowl stadium one of the most important sports venues in Southern California. It is the home football stadium of the UCLA Bruins and a venue for many other important sports and entertainment events each year. Additionally, it is the locale of the Rose Bowl Flea Market that is scheduled regularly on the second Sunday of each month. Just north of the stadium, the Brookside Golf Club with its two 18-hole golf courses and Club House is another key asset in Pasadena’s inventory of recreational facilities. During the more significant Rose Bowl events, the Brookside golf courses are used as a temporary parking area to accommodate parking demand for the larger stadium events. Various other sports, recreation and park facilities are provided in this area, as well.

One of the most important recreation features, for the surrounding communities and for others from throughout the Los Angeles Region, is the Rose Bowl Loop. The roadways that encircle the Rose Bowl and Brookside Golf Courses provide a uniquely valuable resource to the community. Bounded by West Drive, Washington Boulevard, Rosemont Avenue, and Seco Street, the Loop’s roadways are currently utilized by automotive, bicycle, skating, and pedestrian traffic. The innermost portion of the Loop is a dedicated walkway, separated by a four-foot wide painted barrier from the adjacent bicycle and vehicular traffic. The cyclists typically circulate around the Loop roadways in a clockwise direction, sharing a lane with vehicular traffic.

Because of its low levels of automobile traffic and availability to parking on most days, the Rose Bowl Loop allows for convenient and relatively safe non-motorized transportation, including walking and jogging, skating, and bicycling. During most periods, the atmosphere along the Loop is close to ideal, with high recreational usage and minimal safety concerns.

On typical days, cars, bicyclists, and pedestrians coexist successfully and pleasantly on the Rose Bowl Loop.
A majority of walkers and joggers prefer walking on the right side of the road, despite signs and pavement markings that prohibit going in that direction.

However, on occasions when pelotons consisting of tight packs of 100 or more bicyclists encircle the Rose Bowl every 6 or 7 minutes at a speed of 30 miles per hour, the potential for injury from a collision with motor vehicles or pedestrians increases. These pelotons are often seen on a Tuesday or Thursday evening, and more frequently during Daylight Saving Time. The peloton riders are not formally organized, but are attracted individually to the 3-mile clockwise circuit of the Rose Bowl Loop that can be made without a stop. Bicyclists need to yield only to conflicting vehicles merging at the four corners of the Loop, or to pedestrians and equestrians at selected crosswalk locations. Because of the unique configuration of the Rose Bowl Loop, the Central Arroyo area is rightfully regarded as one of the best recreational locations for racing bicyclists. Avid bicyclists throughout Southern California would face a significant loss of riding opportunities if pelotons were prohibited through a modification of the City code, as had been proposed in Pasadena and had already occurred in Irvine. Modification of the signing and striping of the Rose Bowl Loop could allow for the continuing successful coexistence of these various modes of recreational traffic.

Other means of increasing the separation between bicyclists and other users could be obtained by removing a lane of traffic and creating a single lane dedicated to bicyclists, with both bicyclists and automobile traffic moving in a one-way direction around the Loop. Such a dedicated bike lane has been suggested by the bicycling community.

A limitation to recreational usage of the Rose Bowl Loop comes from the California Vehicle Code. Pedestrians are prohibited, under CVC 21956 (a), from walking “upon any roadway outside of a business or residence district otherwise than close to his or her left-hand edge of the roadway.” To comply with the Vehicle Code, the City posted “Wrong Way” signs and installed “Ped Only” directional arrow pavement markings to direct pedestrians to walk on the left side of approaching traffic around the Loop, walking in a counter-clockwise direction. However, visual observations show that the majority of pedestrians still walk in the
opposite direction, clockwise around the Loop defying the posted signs. Meeting the desires of these pedestrians while avoiding the CVC 21956 (a) restriction against walking on the right side of the roadway could be attained by making changes to what is considered part of the “roadway”. Physical barriers like curbs or flexible delineators could be installed between the pedestrian walkway and the traveled way, but they could become impediments to the skaters, bicyclists, and special event traffic. Another idea could involve changing the appearance of some of the roadway pavement by means of colored asphalt or other pavement applications, so that the pedestrian path could be regarded as a virtual sidewalk.

Any alternative must take into account the potential impacts to the traffic flow during major events that could draw close to 90,000 people to the Rose Bowl. Rosemont Avenue, for instance, was observed to handle 3 lanes of traffic on its two striped lanes, with motor vehicles and transit buses driving atop the pedestrian lane and buffer zone prior to UCLA football games. Even during such a major event, some joggers and bicyclists were observed to be using the Rose Bowl Loop just like any other day.

Concerns about potential conflicts, especially between bicyclists and either pedestrians or automobiles, have led to this study to identify alternative geometric layouts of the Rose Bowl Loop to improve its safety and utility for its various users.

The Central Arroyo Master Plan prepared by the City, dated May 2002, proposed widening the roadways of the Rose Bowl Loop, to enhance the experience of all users, but construction of these improvements may not occur until several years into the future. The Department of Transportation desires an interim solution, and for this reason, this report is prepared to consider some design alternatives to meet that objective.

**About This Study**

This report builds upon previous studies prepared by the City of Pasadena that presented both short-term and long-range plans for the parklands along the Arroyo Seco and adjacent to the Rose Bowl Stadium complex. Most of these earlier planning efforts included discussions, sketches, and/or plans of proposed improvements to the Rose Bowl Loop. This report focuses on the short-term options available to upgrade the recreational opportunities for pedestrians and cyclists in the very near future.
CHAPTER 2 – SETTING

The Arroyo Seco, Spanish for “dry stream”, is a significant geological feature that comes out of the San Gabriel Mountains to the north and continues south through the Cities of Pasadena, La Cañada Flintridge, South Pasadena and Los Angeles to its confluence with the Los Angeles River. The Arroyo and its surrounding valley have been preserved as open space and parklands for a length of eight miles along the entire westerly boundary of the City of Pasadena. The Rose Bowl stadium and Brookside Golf Club lies within what has been labeled the Central Arroyo Seco area.

The Rose Bowl Loop is located in the City of Pasadena, and stretches for 3.10 miles around the Rose Bowl stadium and Brookside Golf Club. The Loop consists of Washington Boulevard on the north, West Drive on the west, Rosemont Avenue on the east, and Seco Street on the south. The area surrounding the project is primarily recreational, institutional, or single-family residential in nature. Beyond Pasadena’s city limits are the communities or cities of, proceeding from north to west to south, Altadena, La Canada-Flintridge, Glendale, Los Angeles, and South Pasadena. The Site Vicinity Map is shown in Figure 1.

Regional and Community Motor Vehicle Access

Regional access to the Rose Bowl Loop is provided by the Foothill Freeway (I-210) to the east and Ventura Freeway (SR-134) to the south. The Foothill Freeway has an interchange with the Ventura Freeway and the northern spur of the Long Beach Freeway (SR-710) approximately one mile southeast of the Rose Bowl Loop. The Foothill Freeway (I-210) has interchanges with Berkshire Avenue and Arroyo Boulevard/Windsor Avenue to the north, Lincoln Avenue and Mountain Street to the east, and Fair Oaks Avenue to the southeast. The Ventura Freeway (SR-134) has interchanges with Orange Grove Boulevard and Linda Vista Avenue/San Rafael Avenue to the south of the Loop.

Direct local access to the Loop itself is limited to only ten roadways, listed clockwise as follows: Parkview Avenue on the northwest, Rosemont Avenue and Washington Boulevard on the northeast, Rose Bowl Drive and Arroyo Boulevard on the east, Seco Street and Rosemont Avenue on the southeast, Arroyo Boulevard on the south, Seco Street on the southwest, and Salvia Canyon Road on the west.
**Existing Loop Roadways**

The Rose Bowl Loop is defined herein as a rectangular shaped system of two relatively short east-west roadway segments, each being slightly less than 0.40 miles long, joined with two substantially longer north-south roadway segments, each of which are approximately 1.25 miles in length. Accordingly, the total length of the Loop roadway system is approximately 3.10 miles. West Drive, Washington Boulevard, and Rosemont Avenue, which form the west, north, and east sides of the Loop, respectively, are considered to be park roads, while Seco Street on the south edge and streets outside of the Loop are considered to be a city street.

The Loop currently consists of roadways with one traffic lane in each direction, except for Seco Street and segments along Rosemont Avenue that provide 2 lanes in each direction. Motorists and bicyclists traveling clockwise around the Loop face no “STOP” signs. “YIELD” signs are used to control this circulation pattern at several intersecting streets. For the counterclockwise Loop traffic and the traffic on streets entering or crossing the Loop, the intersecting points are generally controlled by “STOP” signs.

Almost two-thirds of Loop roadways are directly adjacent to fences surrounding the Brookside Golf Course. These fences typically consist of a 1.5- to 2-foot high stone wall with a 6-foot chain link fence constructed on top, with numerous driveway access openings. Typically, the roadway pavement directly abuts the golf course fence. The opposite sides of the paved roadways are typically unimproved, with dirt shoulder areas which provide some off-street parking. On-pavement parking is allowed only on Rosemont Avenue in the vicinity of the Club House, and on the exterior of the Loop at the intersection of Rosemont Avenue and Washington Boulevard.

Rose Bowl Parking Lots K and L are located within the roadway Loop at the southwest corner of the Loop. These lots are bounded by the golf course on the north and by the Arroyo Seco on the east. The edges of these lots that are directly adjacent to the Loop roadways are separated from those roadways by a concrete rolled curb/gutter that is traversable by motor vehicles.

The Rose Bowl Loop has an 8-foot wide counterclockwise pedestrian path that is separated from the adjacent bike and vehicular traffic lanes by a 4-foot wide painted buffer, delineated with diagonal stripes between two stripes. Pavement markings and posted signs require that pedestrians who use this facility should travel in the counterclockwise direction around this Loop. Other than pavement markings, no physical distinction such as edge of pavement, pavement texture, delineators, curb, or berm exists between the traveled way of the roadway and the walkway.

Washington Boulevard forms the north edge of the Loop, from Rosemont Avenue to West Drive. This segment has a bridge across the Arroyo Seco drainage channel, as well as three cart crossings for the adjacent Brookside Golf Course. Maintenance access for the golf course is provided at the most easterly of these crossings. A total of five other golf course driveway openings are provided in this area, with two of those driveways used for Rose Bowl event parking (Lots 9 and 10) on the portion of the golf course north of Washington Boulevard. Total roadway pavement widths in this area are generally in the range of 48 to 50 feet, without any
curbs or sidewalks, except across the bridge which consists of a 40-foot wide roadway with 5-foot wide sidewalks along both sides.

West Drive forms the west side of the Rose Bowl Loop and extends from its intersection with Washington Boulevard and Parkview Avenue at the north end to Seco Street at the south end. Salvia Canyon Road is the only intersecting roadway along this western Loop segment, providing access for the residential area to the west. West Drive has pavement widths that vary between 40 and 45 feet. A total of seven gated driveways provide access to the golf course, with four being used for Rose Bowl event parking in Lots 5, 6, 7 and 8. Additionally, two other driveways south of the golf course provide access for Lots K and L.

Rosemont Avenue forms the east side of the Loop from Washington Boulevard on the north to Seco Street on the south. The northerly extension of Rosemont Avenue provides access to an adjacent residential community, to the Foothill Freeway (via Arroyo Boulevard), and to the adjacent communities of Altadena and La Canada-Flintridge. To the south, Rosemont Avenue intersects with Orange Grove Boulevard, to provide access to the regional freeway system and to downtown Pasadena. The Loop portion of Rosemont Avenue has roadway widths typically in the range of 50 to 58 feet, although in the area of the Brookside Club House, this roadway widens to slightly over 70 feet. One segment of Rosemont Avenue directly east of the Rose Bowl stadium, between Rose Bowl Drive and Arroyo Boulevard, is about 34 feet wide, representing the narrowest portion of the Loop.

The south side of the Rose Bowl Loop is formed by Seco Street between Rosemont Avenue on the east and West Drive on the west. Seco Street provides two traffic lanes in each direction. Between Rosemont Avenue and Arroyo Boulevard, Seco Street is a divided highway consisting of two roadways ranging from 36 to 40 feet, separated by median landscaped islands. The undivided segment of Seco Street west of Arroyo Boulevard has a width of approximately 54 feet, including the bridge that crosses the Arroyo Seco. This bridge also accommodates 5-foot wide sidewalks along both sides.

Only portions along Rosemont Avenue south of the Brookside Club House building and along Seco Street between Rosemont Avenue and the bridge crossing the Arroyo Seco are partially or fully improved with curbs and gutters.

Some park roads known as Arroyo Boulevard and Rose Bowl Drive lie within the Loop to the south and east of the Rose Bowl stadium. Access to these interior park roads is limited by means of lockable gates.

Traffic volumes for existing weekday conditions in the vicinity of the Rose Bowl Loop were obtained from City of Pasadena tube counts. These counts are included in Figure 2. During weekdays in September 2008, Washington Boulevard on the north edge of the Loop carried about 2,000 daily trips, Rosemont Avenue on the east edge of the Loop carried 4,700 daily trips south of the Club House, and West Drive on the west edge carried 2,300 daily trips. The busiest loop segment was Seco Street, on the south edge, which carried 8,100 daily trips.
FIGURE 2

TRAFFIC VOLUME COUNTS
(COUNTS CONDUCTED BETWEEN
TUESDAY 9/16/08 THROUGH THURSDAY 9/18/08 AND
TUESDAY 9/23/08 THROUGH WEDNESDAY 9/24/08)
**Bikeways**

Compared to the rest of the Southern California region, the City of Pasadena has a very extensive system of designated Class II bike lanes and Class III bike routes. Many of them extend into the Arroyo Seco ravine. See Figure 3. The Rose Bowl Loop itself is classified as a Class III bike route, meaning that although no exclusive bike lane is provided, the roadway width and traffic volumes are considered conducive to bicycle travel, and thus “Bike Route” signs are posted along the streets. Bicyclists traveling in a clockwise direction around the Loop encounter no “Stop” signs, only a few “Yield” signs. The Rose Bowl Loop is one of the few places in the nation where one could ride a bicycle for an unlimited distance before returning to the same spot without stopping. For this reason, the Rose Bowl Loop has attained a reputation among bicyclists as a premier site for recreational and training purposes.

Arroyo Boulevard has Class II bike lanes providing a connection to the Loop, from the north off of Rosemont Avenue, and from the south off of Seco Street. These 4 to 5-foot bike lanes are adjacent to the curb of the street. Seco Street serves as a Class III bike route connecting the Loop with bikeways along Linda Vista Avenue to the west and Lincoln Avenue to the east. The City has installed “Enhanced Bike Routes,” which are delineated with a 4-inch white stripe and generally permit on-street parking, along Linda Vista Avenue to the west of the Loop.

Recorded collisions involving bicyclists on the Rose Bowl Loop between January 2005 and October 2008 are summarized in Figure 4. During that period, 22 bicycle-related collisions were recorded, with 11 of the 22 bicycle-related collisions involving vehicles, 6 involving pedestrians, 1 involving a golf cart, 1 involving a scooter, and 2 involving other bikes.

**Pedestrian Facilities**

The Loop’s pedestrian path is a walkway painted on the pavement of the Loop roads. “Wrong Way” and “Ped Only” signs and special pavement markings direct pedestrians to walk in the counterclockwise direction around the Loop. The colorful pavement markers are often ignored by a majority of pedestrians. Most pedestrians, 58% of them, were observed to be walking in the clockwise direction. The only sidewalks along the Loop are on the south side of Seco Street, on a short segment of the west side of Rosemont Avenue directly adjacent to the Brookside Club House, and on the Washington Boulevard and Seco Street bridges over Arroyo Seco.
A video survey was conducted on September 16, 2008, from 6:00 to 7:00 PM, a period with peloton activity to determine the various types of users of the Loop. The results are shown in Figure 5. During this time period, a total of 1,794 users along the Loop were observed. It should be noted that among these users, most of the bicyclists and some of the joggers were observed multiple times during that period. The main peloton was observed to circle the Loop ten times during that hour. Although a count of unique users was not conducted, the ratio of walkers to bicyclists was probably over two to one. During other periods of the week when peloton riders are not present, the ratio of walkers to bicyclists is much higher.

**Equestrian Facilities**

A bridle path is located to the west of West Drive. Equestrian riders could reach this path from stables to the north in Altadena and La Canada by way of a crosswalk across Parkview Avenue on the north end of the Loop. The path crosses West Drive by means of a crosswalk approximately midway between Seco Street and Salvia Canyon Road, and then follows the west bank of the Arroyo Seco channel within the Loop. Upon reaching Seco Street, southbound riders and their horses would use the Seco Street bridge, and then use a crosswalk across Seco Street to reach the horse trail along the east bank of the Arroyo Seco channel. The trail leads south ultimately to stables located in South Pasadena. Based on multiple observations and lack of evidence on the trail, the bridle path is rarely used by horses.

**Public Transit Service**

The core areas of the City of Pasadena have an extensive network of local and regional bus transit routes operated primarily by the Pasadena Area Rapid Transit System (ARTS) and by the Los Angeles County Metropolitan Transportation Authority (Metro). Other carriers serving this area or connecting with other areas include the City of Los Angeles (Commuter Express and Dash), the Glendale Beeline, and Foothill Transit. See Figure 6.

However, only ARTS Lines 51 and 52 travels on a portion of the Rose Bowl Loop, along the south edge on Seco Street. To the northwest, both lines serve the North Campus of the Art Center College of Design. Line 52 terminates at the Jet Propulsion Laboratory (JPL) during peak periods. At the other end of these routes, they travel through Old Pasadena, extending as far south as Glenarm Street. Service on both lines is provided only on weekdays from 6:13 AM to 7:48 pm, with headways ranging from 40 to 60 minutes between buses. Service to JPL is limited to three buses during the morning, between 6:10 AM and 8:40 AM, and to four buses during the early evening period, between 4:30 PM and 7:20 PM. No service is provided during early morning and late evening periods, nor on weekends, and therefore of limited benefit for many recreational users.

Any changes in the traffic flow of the Rose Bowl Loop, such as conversion to one-way traffic or changes to the pedestrian walkway, will need to take into consideration impacts to operations of ARTS Lines 51 and 52.
NOTE: May represent multiple counts of the same bicyclists. The main peloton was observed passing a point 10 times within an hour, although the size of the peloton changed with each passing.

**FIGURE 5**
CHAPTER 3 – ANALYSIS OF DESIGN FEATURES

This chapter evaluates a “toolbox” of alternatives that could modify the geometrics of the Loop. The advantages, disadvantages and recommendations associated with each alternative are discussed below.

One-Way vs. Two-Way Pedestrian Travel

One-way foot travel along the Rose Bowl Loop is currently dictated by compliance with the California Vehicle Code, whereby the pedestrian on a roadway must walk along the left side of the roadway.

Evidenced by the majority of pedestrians walking in the opposite direction, the designated one-way pedestrian travel appears to be inconvenient to many pedestrians. Many of them use only a portion of the Loop and prefer to travel along a portion of the Loop in both directions. This could apply to recreational walkers, who may not necessarily want to complete the entire 3-mile circuit, as well as to those with other purposes, such as walking to the golf course club house, soccer practice on the lawn, or a football game or swap meet at the stadium.

Recommendation on One-Way Pedestrian Travel: Two-way pedestrian travel should be provided if feasible. One-way pedestrian travel should be maintained only if required to conform to the California Vehicle Code.

Walkway Flush with Road Surface versus Sidewalk

Providing a sidewalk at a higher elevation from the traveled way of the road would provide a perceived safer separation of pedestrians from automobile traffic, although in reality the amount of safety is probably marginal. Curbs are usually not high enough to stop an out-of-control car. If they were, the curb height would present a falling hazard for pedestrians. Sidewalks also have the disadvantage of creating a tripping hazard for bicyclists, especially when a large number of bicyclists are present like during the passage of a peloton. Skaters, who often use the existing walking path, but who skate out on occasion into the vehicle traveled way to avoid pedestrians, would lose that opportunity with a curb and sidewalk. Even the use of rounded mountable curb would cause a tripping hazard with bicyclists and skaters.

Sidewalks would reduce the amount of roadway available to cars and buses during major events held at the Rose Bowl stadium. Before and after football games, the Police Department, through the use of barriers and delineators, frequently directs motor vehicles to use the entire width of the Loop roadways, including the striped pedestrian walkway. Installing a sidewalk on the loop roads could effectively reduce game day capacity by a lane of traffic.

Sidewalks have the advantage of conformance with California Vehicle Code Section (CVC) 21956 (a) which states that pedestrians are prohibited from walking “upon any roadway outside of a business or residence district otherwise than close to his or her left-hand edge of the roadway.” If allowing two-way pedestrian travel is intended, then walking must not occur upon what is considered part of the vehicular roadway.
The use of colored asphalt, textured paint patterns, pavers, or other similar designs can more clearly define the pedestrian walkway areas and would deter intrusions by adjacent wheeled activities. If they clearly define the walkway as separate from the roadway, through the use of distinctive surface patterns or color, striping, signing, or barriers, then CVC 21956(a)’s requirement for one-way pedestrian travel would not apply. Such a walkway can be installed inexpensively compared to sidewalk, and avoid modifying drainage and the need to provide curb ramps. The least expensive method, at least in terms of initial installation, would be by means of painting the roadway surface with a distinctive color. The color should not be yellow, which is reserved for roadway medians. Any other color is allowable.

It should be noted that in the autumn of 2009, Pasadena Public Works conducted an experiment with a mixture of slurry seal and paint on a small patch of pavement. The result was considered less than satisfactory, because the resulting color was not sufficiently distinctive from uncolored slurry seal.

**Recommendation on Walkway Flush with Road Surface versus Sidewalk:** Placing the walkway flush with the road surface is desirable to avoid tripping hazards to pedestrians, bicyclists, and skaters, and to retain flexible use of the roadway for major events at the stadium. However, the walkway must be defined through the use of distinctive patterns, colors, striping, signing, or barriers in such a way to allow two-way pedestrian travel.

**Classes of Bikeway Facilities**

Bikeway facilities are generally categorized within the following classifications:

- **Class I (Bike Path)** - This type of facility is intended to be completely separate from the other paths and/or roadways that are used by others, such as pedestrians and motorized vehicles.

- **Class II (Bike Lane)** - This type of bike facility involves a path or roadway that is shared with other traffic, but the bike riders are provided a striped lane for their use only, with appropriate markings and signage.

- **Class III (Bike Route)** - In this case, the bike route is only designated by signs that are placed along the roadway that is shared with other vehicular traffic. Typically, this designation implies that there is some space on the roadway to allow the bicycles to operate with a reasonable degree of safety, but there is insufficient room to otherwise provide a Class II bike lane. The Rose Bowl Loop is currently designated as a Class III bike route.

The volume of bicyclists on Rose Bowl Loop roads on some evenings is very high, and would seemingly warrant a separate Class I bike path. However, the needs of the peloton could actually be better served with a Class II bike lane or Class III bike route, because those classes could better accommodate the intermittent surge of high speed bicyclists than a more confined Class I bike path.
Due to the limited total roadway width of the Loop roads, and the large number of closely packed bicyclists who ride in pelotons, a Class II bike lane would necessarily have to be one-way and as wide as a vehicle lane. The installation of a one-way bike lane does not preclude the opportunity for bicyclists to travel in a motor vehicle lane headed in the opposite direction.

The Class III bike route that is currently provided on the Rose Bowl Loop appears to adequately handle bicyclist demand most of the time, with the possible exception of peloton evenings.

Recommendation on Class of Bicycle Facility: The bikeway should either remain a Class III bikeway or be converted to provide a one-way Class II bike lane.

Clockwise vs. Counterclockwise Circulation (Bicycles)

With pedestrians on the interior or stadium side of the roadway, and the vehicular traffic constituting the outermost portion of the Loop, bicyclists and other wheeled recreationists could be provided for in the middle between the pedestrians and the autos. With a two-way or a one-way clockwise pattern for the vehicular traffic, the most practical bicycle circulation pattern would be a clockwise direction. This places the cyclists in the “standard” position relative to the vehicular travel, which is to the right of motor vehicles traveling in the same direction. This arrangement would generally create less of a conflict or safety issue in cases where cyclists would intrude into the adjacent traffic lane. Furthermore, bicyclists and motorists traveling in a clockwise direction would not be faced with any stop signs, only yield signs. This might be a major reason for the current popularity of the Rose Bowl Loop among bicyclists.

If, instead, a counterclockwise circulation pattern were adopted for the bicyclists traveling between the pedestrians and the vehicular traffic, with the autos circulating clockwise and positioned to the right of the cyclists, a “British-style” pattern of operation would exist. This might suggest that a physical barrier would be necessary to prevent head-on conflicts between the vehicular traffic and the cyclists. Alternatively, the cyclists could be moved to the outermost side of the Loop for a more standard auto-bicycle orientation, with or without an exclusive bike lane. Access between the bicycle lane and the surrounding areas would typically involve fewer vehicular conflicts, as right turn movements could occur directly between the bicycle lane and the surrounding streets without crossing any other vehicular paths at these access points. This benefit would be minimal, however, considering that most bicyclists who use the Loop park their cars or trucks in parking lots within the Loop. Furthermore, cyclists on this outermost lane would experience conflicts wherever the autos are entering and exiting the vehicular Loop, whereas these conflicts would not exist with any of the other bicycle options.

Recommendation on Direction of Bicycle Flow: If a Class II one-way bike lane were being considered, only the clockwise one-way movement of bicyclists should be considered.

One-Way Automobile Roads

Due to the limited width of the Loop roadways, installation of a Class II bike lane requires that motor vehicle traffic be confined to a single one-way lane, because in order to accommodate a peloton, the Class II bike lane would need to be wider than the 5-foot lanes typically seen in other parts of the city. A one-way automobile road poses some rather obvious disadvantages in
terms of vehicular access. Motorists who would like to make a short trip opposite of the chosen flow direction, for instance, between the front of the Brookside Clubhouse and its parking lot would either have to drive 3 miles around the entire Loop, or cut through the neighborhood to the east by way of Washington Boulevard, Arroyo Boulevard, and Rose Bowl Drive.

One-way automobile roads would require the installation of left turn or right turn prohibition and one-way traffic signs. These signs would have to be removed or covered when major events at the Rose Bowl stadium require two-way operation.

One important consideration for one-way conversion is the availability of convenient alternate routes, particularly for the direction of travel being eliminated by the one-way conversion. For example, north-south circulation and access to the adjacent residential community along the west side of the Rose Bowl Loop would be served by Linda Vista Avenue. Similarly, along the east side of the Loop, the combination of Arroyo Boulevard, Everts Street, and Forest Avenue provides an alternative north-south route for the Rosemont Avenue portion of the Loop.

East-west circulation alternatives for affected segments of the Rose Bowl Loop are much more limited. A single street, Washington Boulevard, at the north end of the Loop, serves as the most direct connection between the residential area to the west and the main part of the City of Pasadena to the east. This route also provides access for these same residents to the 210 Freeway ramps at Arroyo Boulevard and at Lincoln Avenue. The loss of this route would require a lengthy alternative trip either southward to Seco Street or northward through the City of La Canada Flintridge. On the south end of the Loop, Seco Street is an even more crucial east-west connection, not only as a functional commuter link, but also as the main access route into the Rose Bowl area itself.

Because Seco Street has a wide right-of-way, it can continue to function as a two-way street for whatever configuration is proposed for the walkway and bikeway around the rest of the Loop. Given its traffic volumes and importance in terms of connectivity, one-way operation of Seco Street should not be seriously considered. Washington Boulevard is narrower, especially at its bridge over Arroyo Seco, so maintaining a two-way operation could preclude installing a Class II bike lane on that segment. However, because of Washington Boulevard’s low traffic volumes, the risk of traffic accident appears remote and insufficient to warrant conversion of Washington Boulevard to a one-way street if a Class II bike lane were installed.

**Recommendation on One-Way Automobile Traffic:** Seco Street should remain a two-way road. Washington Boulevard should remain two-way as well, which would preclude a one-way bicycle lane on that segment. One-way automobile traffic appears feasible, albeit inconvenient, and may be considered as a design alternative for West Drive and Rosemont Avenue.

**Clockwise vs. Counterclockwise Circulation (Autos)**

If a one-way bicycle lane were provided in the clockwise direction, automobile traffic would be forced into a one-way lane as well, due to the limited roadway width of West Drive and Rosemont Avenue. (Washington Boulevard and Seco Street would be assumed to remain two-way streets, and Washington Boulevard would lack a Class II bike lane.)
For vehicular traffic, a clockwise one-way lane would reduce the relative speed difference between automobiles and bicyclists. In the case of peloton riders, the speed difference would be negligible. Furthermore, if the size of the peloton were to swell considerably, the overflow bicyclists could spill over into the automobile traffic lane. However, a clockwise automobile lane would not allow for bicyclists to reverse their direction. Every bicyclist, ranging in skill from the avid racer to a casual recreational cruiser, would be forced to complete the 3-mile circle. Furthermore, the Loop would become unavailable to commuters on bicycles who might have used a short segment of northbound Rosemont Avenue to reach a home to the east of the Arroyo.

A counterclockwise vehicle lane would impose fewer problems for bicyclists. Motorists traveling in the counterclockwise direction would be plainly visible to oncoming bicyclists in the clockwise direction. The counterclockwise vehicle lane allows for bicyclists to travel in both directions, which benefits bicyclists who are making a functional trip along a short segment of the Loop, or recreational bicyclists who do not wish to make the complete 3-mile circuit.

**Recommendation on Direction of One-Way Automobile Travel:** In conjunction with a clockwise one-way Class II bike lane on West Drive and Rosemont Avenue, only counterclockwise automobile travel appears feasible. The one-way vehicle travel flow and its restrictions are shown on Figure 7.
FEATURES, UNDER THIS OPTION:
- Motor vehicles travel counter-clockwise around the Loop.
- Bicyclists may travel in an exclusive bike lane clockwise, or with motor vehicles counter-clockwise.
- Seco Street and Washington Boulevard remain two-way.

FIGURE 7
Types of Separators

The means to separate pedestrians from wheeled travelers such as bicyclists and motorists can range from painted stripe to impassible barriers. Separation in the form of a sidewalk has been discussed earlier. Some costly or inflexible separators such as grade separations or K-rail have been ruled out as infeasible. The following is a listing of the traffic control measures considered feasible for separating different pathways:

Signs -- These can signify and regulate intended uses, as well as the intended separation of the different uses, but it is left to the individual for compliance and/or to the authorities for enforcement. The currently posted signs designate a “Bike Route”, notify clockwise walking pedestrians they are walking the wrong way, and require pedestrians to walk in the legal direction.

Single Stripe between Uses -- This is inexpensive and does not pose a tripping hazard for bicyclists, skaters, or pedestrians. Striping may be difficult to see on a rainy day, although pedestrian and bicyclist activity is likely to decrease on those days. Striping provides no protection against an errant vehicle crossing the line. If striping were to be used, it should consist of a non-slippery paint, to reduce the chance of bicyclist falls.

Special Pavement Markings -- The Rose Bowl Loop currently has elaborate pavement markings defining the path of each user. It should be noted that those particular markings, which are fading and peeling, were intended to be temporary and were not intended to be maintained.

Difference in Pavement Treatments – The difference in pavement treatments, such as the border of asphalt-concrete and colored asphalt, even when flush with each other, could be sufficient to define the difference between a roadway and a pedestrian walkway. By itself, this might be insufficient to escape the one-way pedestrian requirement of CVC 21956(a), but additional features such as striping and flexible delineators should make it sufficient. It should be noted that a yellow colored pavement is reserved for median islands according to the California Manual of Traffic Control Devices. If colored pavement is used for the walkway, a color other than yellow must be used.

Wider Walkway – A wider walkway would probably be necessary to handle two-way pedestrian travel and still maintain separation of pedestrians from bicycle and motor vehicle traffic.

Wider Travel Lane – A wider travel lane would provide more room for motor vehicles and bicyclists to share the road further away from the pedestrian walkway. This probably requires narrowing the outside lane of the Rose Bowl Loop.

Raised Pavement Markers -- These solve the visibility problem during rain, and if reflective markers are used, improve visibility at night. However, recreational walkers and bicyclists are less likely to be present during rain or at night. Raised pavement markers also increase the possibility of tripping for bicyclists, skaters, and pedestrians.
Rumble Strips – These allow the individual to feel and/or hear when potential conflicts between different users are about to occur. Rumble strips have been used along the shoulder of Pacific Coast Highway in the Pacific Palisades area, with some success in separating automobile traffic from bicycle traffic. For the Rose Bowl Loop, though, where the main concern is separating bicyclists from pedestrians, the rumble strips increase the possibility of tripping for pedestrians and skaters.

Flexible Delineators (“candlesticks” or paddles) -- These devices provide a separation of the uses and a sense of fencing between the areas of different uses. Although flexible, the delineators are not indestructible, and would need frequent maintenance or replacing. These delineators may need to be removable so that they would not conflict with traffic flow on football days and during other special events. Used in combination with a 12-inch stripe or barrier pavement marking, delineators with reflective tape could provide a very visible definition of walkway edge in rainy or dark conditions.

Raised Separator Islands -- These installations provide at least a minimal vertical barrier to reduce the potential for crossing over and conflicting with adjacent uses. Rolled or mountable curbs can be used to facilitate some vehicular crossings, such as by emergency vehicles. They could only be placed in locations where they would not conflict with traffic flow on football days and during other special events, which might prevent their use on most of Rosemont Avenue and West Drive.

Recommendation on Separators: Any of the various separators could be appropriate, depending on how they are used. The 12-inch stripe with delineators could be the best combination for the Rose Bowl Loop because they provide high visibility while occupying very little width out of the roadway cross-section, and because the delineators could be temporarily removed if they interfere with stadium event traffic. Painted or colored asphalt could provide improved definition of the walkway.

Summary of recommendations

Two-way pedestrian travel should be provided if feasible. One-way pedestrian travel should be maintained only if required to conform to the California Vehicle Code.

Placing the walkway flush with the road surface is desirable to avoid tripping hazards to pedestrians, bicyclists, and skaters, and to maintain traffic handling flexibility on stadium event days, but the walkway must be defined through the use of distinctive patterns, striping, signing, or barriers in such a way to allow two-way pedestrian travel.

The bikeway should either remain a Class III bikeway, or be converted to provide a one-way Class II bike lane.

If a Class II one-way bike lane were being considered, only the clockwise one-way movement of bicyclists should be considered.
Seco Street should remain a two-way road. Washington Boulevard should remain two-way too, which would preclude a one-way bicycle lane on that segment. One-way automobile traffic appears feasible and may be considered as a design alternative for West Drive and Rosemont Avenue in conjunction with a clockwise one-way Class II bike lane, but only in the counterclockwise direction.
CHAPTER 4 – CROSS-SECTION RECOMMENDATIONS

The various recommended design features from the previous chapter can be combined into a tremendous number of possible cross-sections, but only a few combinations are truly feasible. Some of the most promising cross-sections are shown in this chapter.

Existing Cross-Section

Figure 8 shows a typical cross-section of the existing condition. Using the terminology of the previous chapter, the existing condition consists of the following design features:

- One-way pedestrian travel is provided in the counterclockwise direction.
- Walkway is flush with the roadway surface.
- Bikeway is a Class III route, with predominant bicyclist travel in the clockwise direction.
- Two-way automobile traffic travels in two 15-foot lanes.
- Separator devices consist of a 4-foot barrier zone, signs requiring pedestrians to walk in the clockwise direction, and special pavement markings.

The Rose Bowl Loop has become a popular walking and bicycle riding destination with this existing cross-section, with a low rate of accidents and few other problems. However, it has two notable failures. First, the requirement that pedestrians walk in the counterclockwise direction is not being obeyed. Pedestrians are choosing to ignore the signs and pavement markings. Second, the 4-foot barrier zone is not serving as a barrier at all, but as an addition to the walkway.

Recommended Cross-Sections

For all recommended cross-sections that follow, we will assume that two-way pedestrian travel must be provided, that sidewalks will not be constructed, and that the predominant bicyclist travel direction should remain clockwise to avoid “STOP” signs. This reduces the number of possible alternative lane configurations to two:

- Enhanced Two-Way Walkway. (Figure 9)
- Potential Future One-Way Loop (Figure 10)

Both alternatives consist of the following features, listed from the interior side (stadium side) to the exterior side of the Loop roadway:

1. A 13-foot wide colored walkway separated from bicycle or motor vehicle flow by a 12-inch white stripe with flexible delineators. This replaces the current 8-foot walkway and 4-foot buffer, effectively increasing pedestrian space by two feet.
2. A 15-foot lane for travel in the clockwise direction. Under the Enhanced Two-Way Walkway configuration, this lane would provide for a mixed flow of motor vehicles and bicyclists. Under the Potential Future One-Way Loop, this lane would be Class II bike facility for bicyclists only.
3. A 13-foot lane for travel in the counterclockwise direction for mixed flow traffic. Under the Potential Future One-Way Loop configuration, this lane would be the only lane available for motor vehicles. This lane would be narrowed from the current 15-foot width, effectively transferring two feet of width to the pedestrian walkway.

It should be noted that these alternatives are interchangeable through the addition or deletion of signs and pavement markings. For this reason, the 1st alternative should be regarded as the recommended initial alternative, with the 2nd alternative being a future consideration if a Class II bikeway were desired. The dimensions of lanes should be as shown in Figure 9. In situations where the roadway is too narrow to accommodate those dimensions, then the mixed flow bicycle and motor vehicle lane clockwise could be narrowed to as little as 13 feet. Any additional narrowing would be accomplished by narrowing the walkway. The outside counter-clockwise lane should maintain no less than a 13-foot width.
FEATURES:
- Pavement markings and signs specify one-way pedestrian flow, but are disregarded by many.
- Four-foot striped buffer is intended to separate pedestrians from bicyclists. However, pedestrians use the buffer as additional walkway, and often encroach into the bicycle and vehicle lane.

FIGURE 8
FEATURES:

- Walkway is widened to 13 feet, allowing 2-way travel. "Wrong Way" signs will be removed.
- Walkway is on painted pavement rather than a separate sidewalk, to allow motorist use during special events.
- Flexible delineator posts separate pedestrians from bicyclists and vehicular traffic.
- Some parking restrictions may apply.

FIGURE 9
FEATURES:
- Similar to Enhanced Two-Way Walkway.

IN ADDITION:
- Motorists travel the loop one-way counterclockwise.
- Bicyclists travel in a 15-foot bike-only lane.
- Seco Street and Washington Boulevard remain two-way.
- Turn restriction will apply at some intersections.
- Roadway modifications subject to future environmental studies.

FIGURE 10
CHAPTER 5 – SEGMENT RECOMMENDATIONS FOR SLURRY-SEAL PROJECT

The Rose Bowl Loop roadways are scheduled to be slurry-seal resurfaced in early 2010. The Loop will be modified based on the recommendations for an Enhanced Two-Way Walkway described in the previous chapter. Conceptual-level drawings have been included in this chapter to show how the recommendations can be implemented as part of that slurry-seal project.