

MEMORANDUM



To: Colin Bogart, Initiative Coordinator

From: Matt Benjamin, *Alta Planning + Design*

Date: June 5, 2009

Re: Riverdale / Maple Corridor Bicycle and Pedestrian Improvements

This document is a FINAL memorandum describing Alta's field observations and potential improvements along the Riverdale / Maple corridor, fulfilling the Task 2 deliverable as described in the contract Scope of Work. The memorandum includes a "Toolbox" of potential improvements, followed by an analysis and recommendations for each segment within the corridor. The document includes the changes recommended in our discussions and documented in your email dated June 2, 2009.

If you have any questions about this memorandum, please contact Matt Benjamin at (213) 489-7443 / mattbenjamin@altaplanning.com.

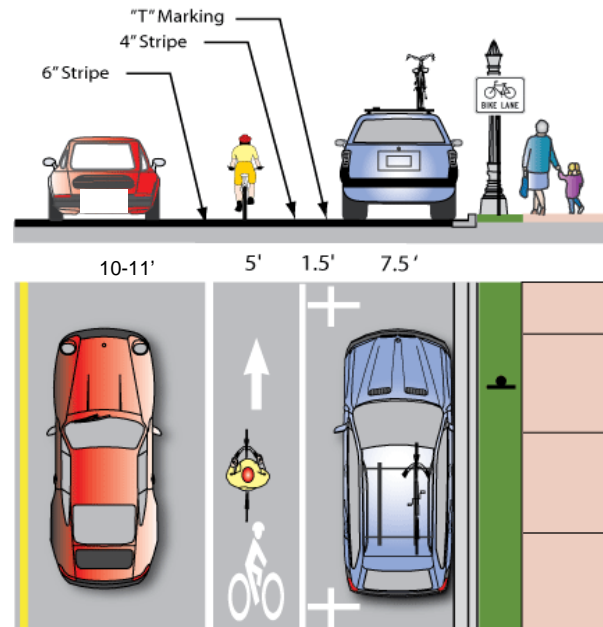
TOOLBOX OF POTENTIAL IMPROVEMENTS

The measures described in this section are intended as a toolbox of options to improve bicycling and walking conditions along the Riverdale/Maple corridor. It is recommended that the City of Glendale consider these options, and decide which are most appropriate.

Bike Lanes

Ensure that bike lanes meet or exceed the standard widths required by Chapter 1000 of the Highway Design Manual. Five feet is the required minimum in areas with curb and gutter. However, in areas with on-street parking, additional safety measures should be considered to minimize the potential for bicyclists using the bike lane to strike (or be struck by) open car doors. The graphic to the right provides one option for improving safety of bike lanes adjacent to on-street parking and could be applied along Riverdale Drive.

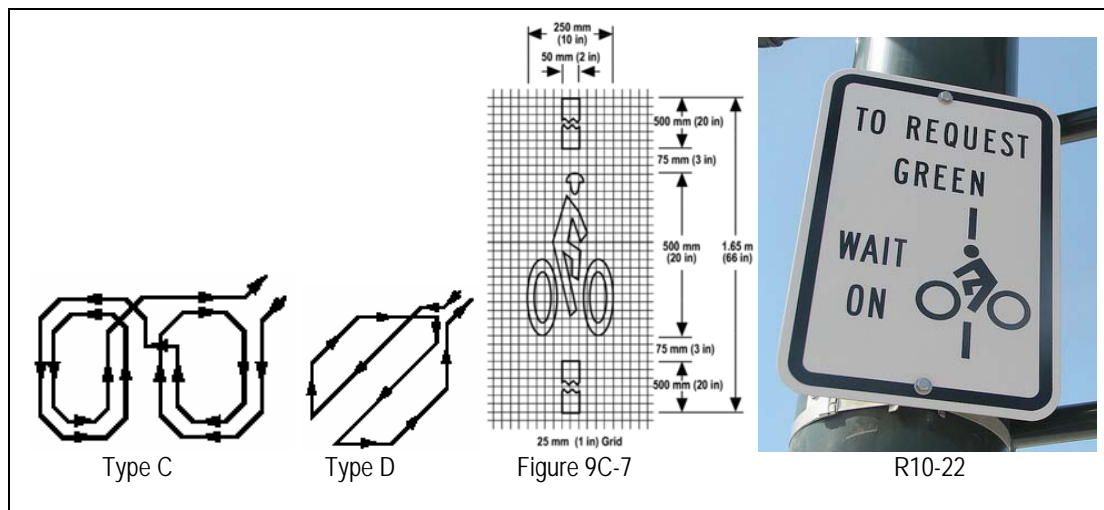
Rather than using available space to widen either the bicycle lane or parking lane, this preferred design provides a buffer zone that will benefit both bicyclists and motorists. The buffer is created by using parking “T’s” to increase separation between the parked vehicle and the outer edge of the bike lane. Bicyclists traveling in the center of the bicycle lane will be less likely to encounter open car doors in their line of travel. Motorists have space to stand outside the bicycle lane when loading and unloading. Also, bike lane stencils should be consistent and follow the dimensions described in the California Manual on Uniform Traffic Control Devices (CA-MUTCD). Because Glendale is a multi-lingual city, the symbol pavement marking—rather than the text pavement marking—should be preferred.



Bicycle Detection at Signalized Intersections

At signalized intersections where inductive loops are used to actuate traffic signals, the loops should be adjusted to detect bicycles or replaced with bicycle sensitive models. On streets with bike lanes, the detection should be placed within the lane on the intersection approach. The quadrupole loop (Type “C”) is commonly used in bicycle lanes because it detects most strongly in center and has sharp cut-off sensitivity. On shared roadways the Bicycle Detector Pavement Marking (CA-MUTCD Figure 9C-7) and the accompanying signage (CA-MUTCD R10-22) should be used in conjunction with the motor vehicle detector loops. The diagonal quadrupole loop (Type “D”) is ideal for shared lanes because it is sensitive over whole area and has sharp cut-off sensitivity. Existing detection hardware can also be adjusted to detect bicycles with the stencil placed over the most sensitive portion of the loop. An additional detector should be placed upstream of the intersection so that—if the detector closest to the stop bar

does not detect the bicyclists—the vehicles in cue behind bicyclist will eventually trigger a green light.



Bike Racks

Add bike racks at key destinations along the route. The City could install bike racks in the public right-of-way. Businesses could be encouraged to install bike racks through a subsidized program where racks are purchased by the City and provided to interested businesses at a reduced cost or free of charge. Rack design and installation should be guided by the Bicycle Parking Guidelines developed by the Association of Pedestrian and Bicycle Professionals (APBP).

Countdown Signals

Installing countdown signals at signalized intersections allows pedestrians (particularly the elderly and parents with small children) to make more informed decisions about how much time they have to cross a major roadway. Bicyclists also benefit, as they can use the timing information to regulate momentum and optimize energy expenditure along the route. The installation of countdown signals should be considered at all intersections.

Curb Extensions (Bulb Outs)

Curb extensions or bulb outs should be considered crossings of any roadways with on street parking. Bulb outs extend the curb into the parking zone and provide several benefits for bicyclists and pedestrians:

- Shorten crossing distance for pedestrians
- Make pedestrians waiting to enter crosswalk more visible to approaching motorists
- Reduces turning radii, slowing turning motor vehicles
- Provides additional space necessary to add dual or perpendicular curb ramps

On streets with bike lanes, neither the extended curb nor gutter should encroach into the bike lane.



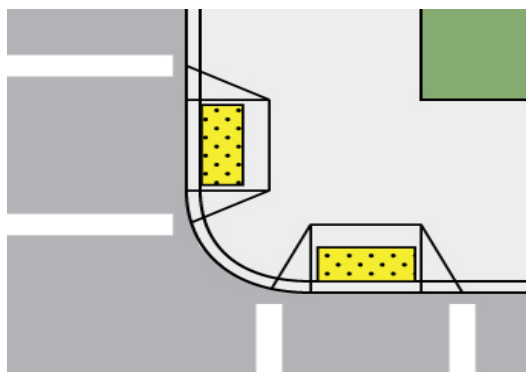
Midblock Curb Extension



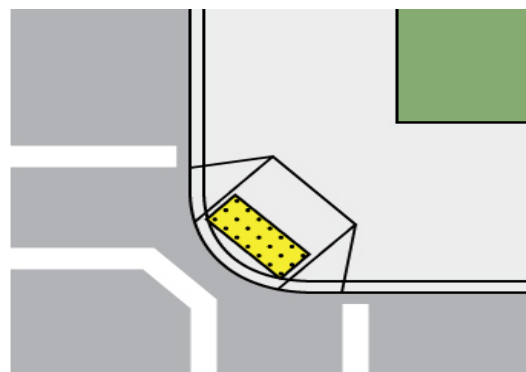
Intersection Curb Extension with Dual Curb Ramps

Curb Ramps

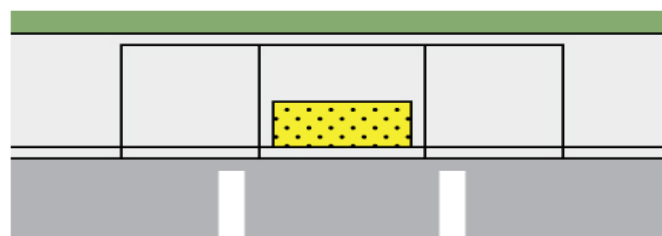
All intersection and mid-block crossings along the route should have ADA-compliant curb ramps. Dual or perpendicular curb ramps are preferred, especially at signalized intersections, to allow users to enter the intersection according to their desired direction of travel. This may require reducing curb return radii in some locations, which would have the additional safety benefit of slowing right-turning traffic. The first priority should be ensuring that curb ramps are provided at both ends of all crossings in the corridor. A second priority, should be the upgrade to dual or perpendicular curb ramps wherever possible. Curb extension facilitate the implementation of perpendicular curb ramps by providing additional space for ramp installation.



Perpendicular Curb Ramps



Diagonal Curb Ramps



Parallel Curb Ramps

High-Visibility Crosswalks, Advanced Stop Lines and Yield Markings

Because the intent of this project is to increase pedestrian (and bicycle) activity along the Riverdale/Maple corridor, high-visibility crosswalks should be considered at all intersections (signalized and unsignalized). This will elevate the level of awareness that this corridor is intended to accommodate high levels of pedestrian activity. Advanced stop lines should be used at signalized crossings. Yield markings should be considered at unsignalized crossings.



High-Visibility Crosswalks and Advanced Stop Lines at a Signalized Mid-Block Crossing



Triangular yield markings and accompanying signage at an unsignalized crosswalk

Interpretive Displays or Kiosks

The recommended route includes three parks: Pacific Park, Maple Park and Carr Park. Interpretive displays advertising the bicycling and walking route should be installed at each park including a map of the corridor, a discussion of the health and social benefits of walking and bicycling, and other pertinent information. The image below provides examples of interpretive displays. Interpretive kiosks would include a roof structure and could incorporate additional space for brochure distribution and bulletin boards for community events.

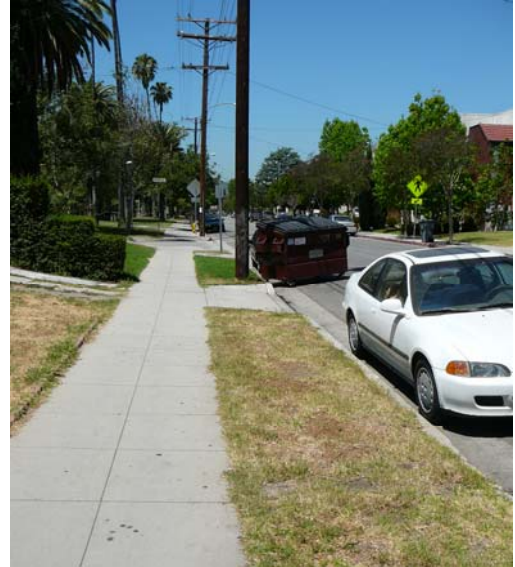


Landscaping

In sunny Southern California, the most important landscaping element for encouraging walking and bicycling is shade. Many segments of the proposed route have existing mature trees providing shade cover for pedestrians and bicyclists. Other segments currently have poor shade cover. Empty tree wells should be filled with drought tolerant tree species that provide large shaded areas for sidewalk and roadway users.



Rock Glen has excellent shade cover



Section of Maple provide less shade for pedestrians and bicyclists

Parking Stripes or Stalls

In order to create a “visual narrowing” effect and encourage motorists to park closer to the curb, parking stripes should be considered along all shared roadway segments. On segments with bike lanes, parking stalls should be considered (i.e. along Riverdale Drive).

Public Art

Public art can lend identity to a route. The City may want to consider working with local artists to help define this or other key walking or bicycling corridors in the City.



Roadway Resurfacing and Maintenance

Because bicyclists are more sensitive to poor pavement conditions than other roadway users, careful attention should be paid to the pavement conditions along the route to ensure a smooth riding surface throughout. In addition, this and other bicycle facilities should receive special consideration when scheduling routine resurfacing or maintenance work.

Rubberized Sidewalks

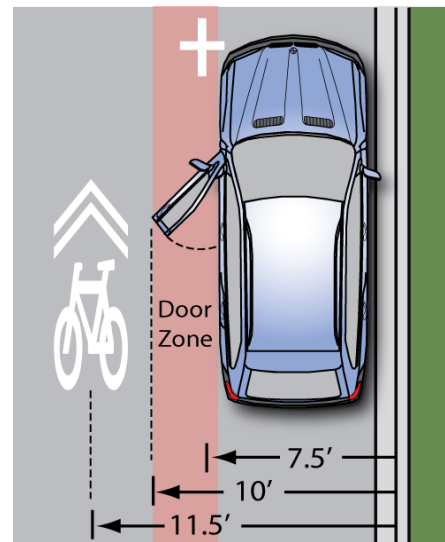
Rubberized sidewalks provide various benefits including improved performance around trees, increased permeability to reduce runoff, and a high-friction walking surface that is easier on the joints of walkers and joggers. While rubberized sidewalks are more expensive to install than standard concrete, the long term maintenance costs may be significantly lower, especially in areas where tree roots are an issue. Colors can be customized to lend identity to a corridor and some colors or materials may provide a higher albedo or Solar Reflectance Index than others.



Shared Lane Markings

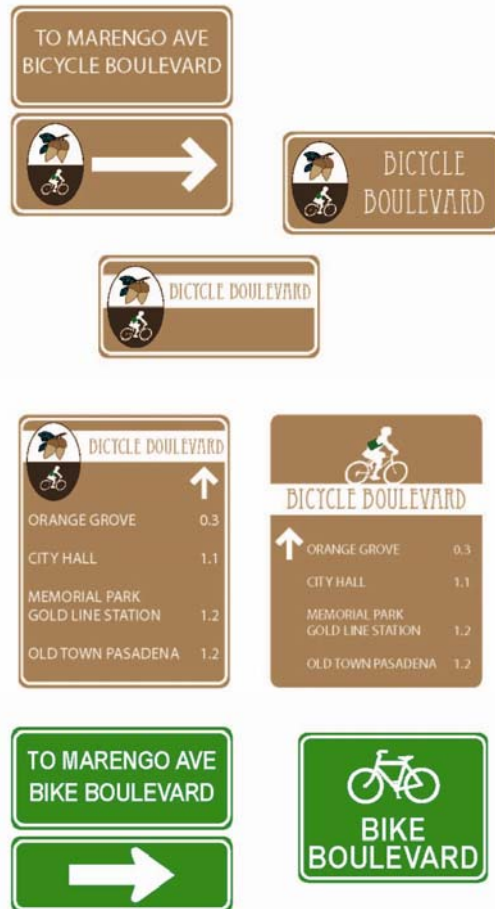
Shared lane markings (SLM) should be installed along all shared lane segments of the route, meaning all segments except Riverdale which has bike lanes. Recently, SLM stencils (also called “Sharrows”) have been introduced for use in California as an additional treatment for Class III facilities and are only currently allowed in conjunction with onstreet parking. The stencil can serve a number of purposes, such as making motorists aware of bicycles potentially in their lane, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bicycle further from parked cars to prevent “dooring” collisions. The pavement of SLMs was adopted for official use by Caltrans on 9/12/2005 as

2003 California MUTCD Section 9C.103 and Figure 9C-107. Placing the SLM in the center of the lane so that it falls between vehicle tire tracks will increase the life of the markings and the long-term cost of the treatment, and may make the markings more visible to drivers since they view the roadway from the left-hand side of the vehicle.



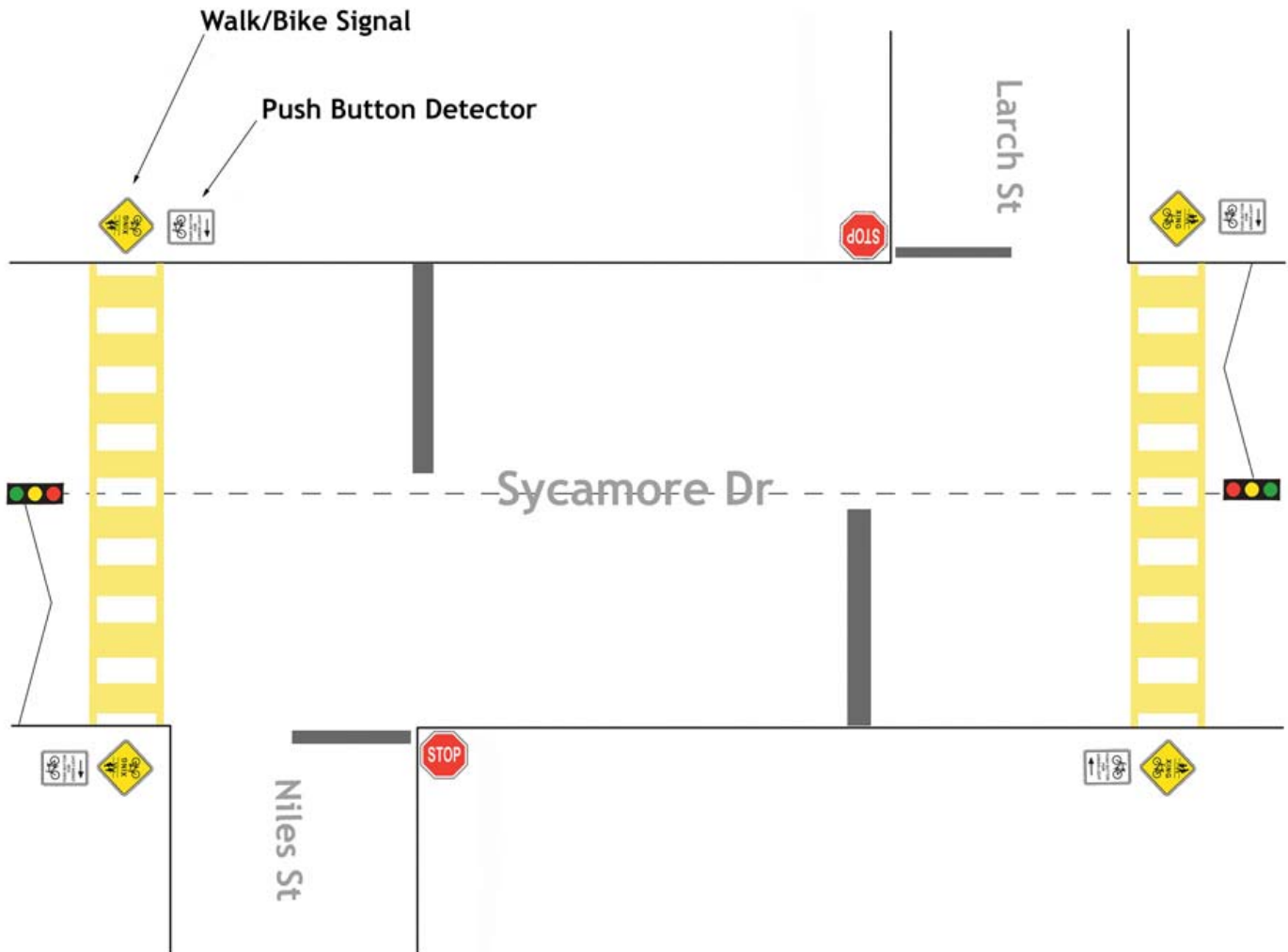
Signage and Wayfinding

Standard bike route signage should be used to identify the route as a Class III bicycle facility per Caltrans standards. Customized signage should also be considered along the route to identify the route and call out relevant destinations. Customized signage may include a unique logo or identity that could be applied to future routes. The signage array to the left (with the exception of the “MAY USE FULL LANE” sign) shows standard signage in the CA-MUTCD. The signs to the right are examples of custom signage. Custom signs should provide wayfinding and distance information for key destinations in the surrounding community including schools, parks and shopping areas.



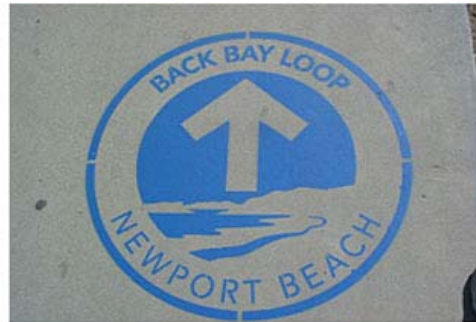
Signalization for Off-Set Intersections (Non-Motorized)

Adding full traffic signals to off-set intersections may increase through traffic along a corridor. The graphic below depicts one option for facilitating crossings for pedestrians and beginner to intermediate cyclists.



Stencils and Other “Horizontal” Signage for Sidewalks

The sidewalk routes can be emphasized and enhanced by placing information on the pavement. One common enhancement includes adding street names at intersections. Another option is to add painted stencils. The first two photos below show examples of street name signage. The image at bottom right shows a confirmation stencil with a mileage marker. The image at bottom left shows a confirmation stencil with unique logo identifying the route.



Traffic Calming

Because the Riverdale/Maple corridor is intended to prioritize pedestrian and bicycle movement, efforts should be made to reduce motor vehicle speeds and discourage through traffic. An area of particular concern is the segment of Maple Street between Central Avenue and Brand Boulevard, where aggressive, high-speed cut through traffic has been repeatedly observed by City staff and the consultant. However, traffic calming devices such as speed humps and traffic circles should be considered throughout the corridor. Traffic diversion or partial closures should be considered if cut-through traffic remains a problem in the long term.

Traffic Diversion

In order to significantly reduce motor vehicle volumes on a roadway prioritized for bicyclists and pedestrians, traffic diversion should be considered. If designed properly, traffic diversion methods such as the ones shown below can facilitate bicycle and pedestrian movement while discouraging through traffic on local streets.



A landscaped diverter provides a gap for bicyclists to continue through the intersection while motorists are forced to turn.



A partial closure allows for two-way bicycle traffic and one-way motor vehicle traffic

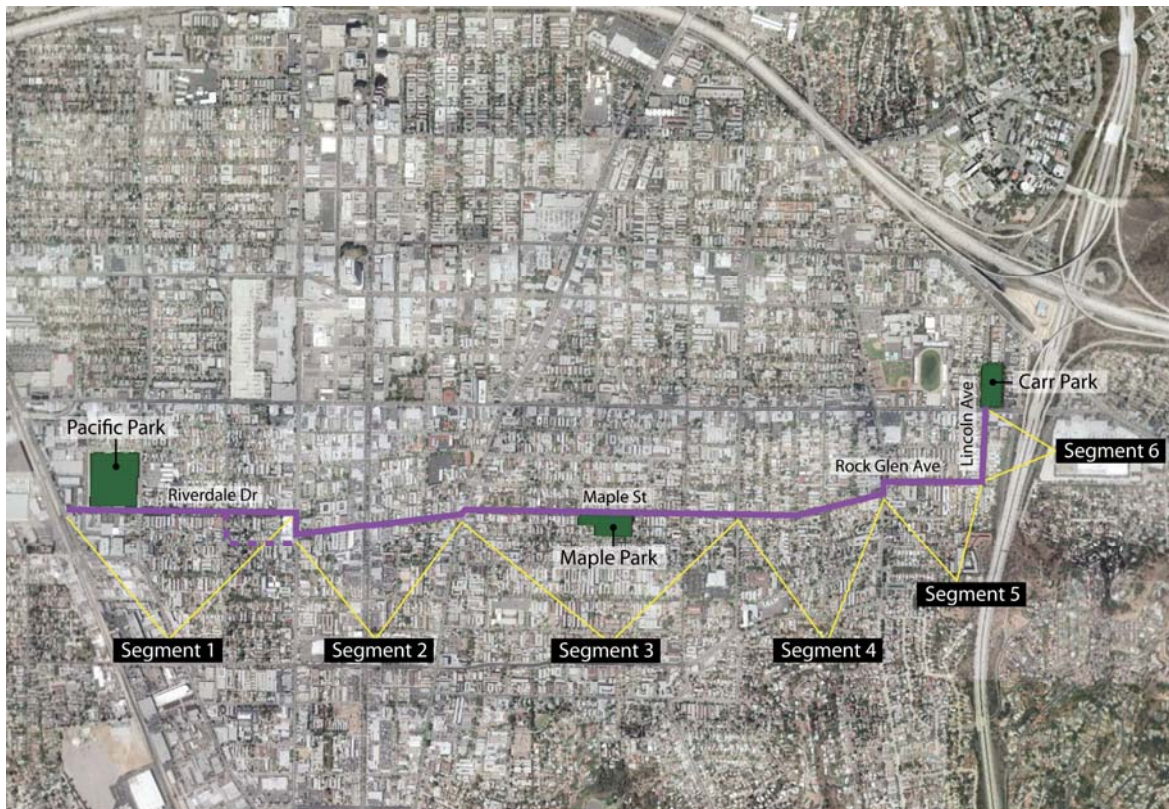
Traffic Circles

Mini traffic circles should be considered at existing stop-controlled intersections, particularly those with existing four-way stops. Ideally, stop signs should be removed to allow traffic moving at intended speeds proceed through the intersection. Under this scenario, bicyclists will be allowed to legally maintain momentum through the corridor.



RECOMMENDATIONS BY SEGMENT

The following section describes each segment and lists key recommendations for each segment. The recommendations listed in this section should receive the highest level of consideration. Other potential improvements described in the Toolbox should also be considered for applicability along each segment. The maps below shows the corridor, parks and the geographic extent of each segment described in this section.



Riverdale/Maple Corridor

Segment #1: Riverdale Drive between San Fernando Road and Central Avenue

This segment includes existing bike lanes on each side of the roadway and good sidewalk conditions and shade cover. West of Pacific, the north side of the road has been recently repaved and restriped providing a smooth riding surface for bicyclists. The bike lane on the north side of the roadway meets the minimum allowable width of five feet per Chapter 1000 of the Caltrans Highway Design Manual and the bike lane pavement markings include the bicycle symbol, which is preferred, but the directional arrow should be added to comply with standards and discourage wrong way riding. The bike lanes throughout the rest of this segment appear to be less than the five foot minimum and the text, rather than symbol-based stencils are used. Double parking in the westbound bike lane was observed near Central Avenue. Crosswalks should be installed as part of the larger signal installation project at Central Avenue.



North side bike lane west of Pacific Avenue



Sidewalk adjacent to Pacific Park



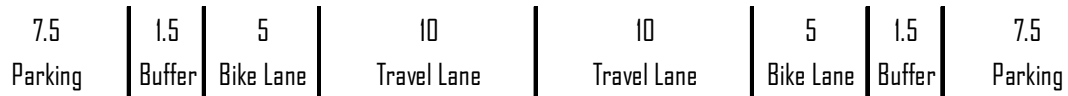
Double Parking in Bike Lane (no outside stripe)



South side bike lane east of Columbus Avenue

Recommendation I.1: Bike Lane Rehabilitation

Restripe the roadway to provide bike lanes that conform to the graphic depicted in Section I of this memo. Travel lanes would need to be narrowed to 10 feet in order to provide parking stalls and a buffer between the bike lane and parking, as shown in the cross section below. Parking stalls could be narrowed to seven feet in order to slightly increase travel lane width.



Bike lanes should include inside and outside stripes, as well as frequent stencils and directional arrows, to discourage wrong way riding and double parking in the bike lane.

Recommendation I.2: Regulatory / Warning Signage

In areas where double parking is observed, consider installation of the R7-9 or R7-9a signs from CA-MUTCD. If wrong way riding is a problem, consider also installing the CA-MUTCD R5-1b and R9-3c signage array shown here so that it will be seen by contraflow traffic.



Recommendation I.3: Signage

Bike lane and/or custom signage should be added along this segment.

Recommendation I.4: Traffic Signals

A new traffic signal installation at Central Avenue and Maple Street has been funded and the design should consider bicyclists and pedestrians as high priority users of that intersection. Bicycle detection and high visibility crosswalks should be included in the intersection design. Depending on the design of the new signalized intersection, some cyclists may prefer to use Columbus Ave (between Riverdale Dr and Maple St) and Maple Street (between Columbus Ave and Central Ave). For example, if the traffic signal is designed to move traffic straight across Central Avenue at Maple, many cyclists will prefer to use Maple rather than traversing the off-set crossing of Central Avenue between Riverdale and Maple.

The existing signal at Brand appears to use actuators, which should be adjusted to detect bicycles, with the Bicycle Detector Pavement Marking indicating the sensitive area and accompanying signage (see Toolbox).

Segment #2: Maple Street between Central Avenue and Glendale Avenue

This segment includes the transition between the bike lanes on Riverdale Avenue and the shared roadway condition that begins at Central Avenue and continues east until the project terminus.



Existing vehicle detection on Maple Street at Central Avenue (loops in pavement)

Recommendation 2.1: Traffic Calming

Traffic calming is recommended along this segment, as aggressive driving behaviors and high speeds were observed in this segment, particularly the short stretch between Central Avenue and Brand Boulevard. Speed humps and/or traffic diversion should be considered throughout this segment.

Recommendation 2.2: Improve Pavement Conditions

Pavement conditions are poor between Central Avenue and Brand Boulevard and should be resurfaced.

Recommendation 2.3: Shared Lane Markings

Add two to three shared lane markings per block (per direction) in this segment. Consider placing markings midway between the centerline and parking stripe for increased visibility and reduced maintenance.

Recommendation 2.4: Parking Stripes

Add parking stripes to delineate the parking area on both sides of the street.

Recommendation 2.5: Centerline Striping

Add or rehabilitate the solid/dashed yellow centerline stripe.

Recommendation 2.6: Landscaping

Shade producing street trees should be added wherever possible through the addition of new tree wells and/or landscaped strips.

Segment #3: Maple Street between Glendale Avenue and Chevy Chase Drive

Recommendation 3.1: Crossing at Cedar Street and Maple Park

A curb cut should be added to the north end of the crossing at Cedar Street and Maple. This crosswalk is used by residents to access the park and no curb cut is currently available at the north end. Curb extension should also be considered here. Extending the curb through the entire (red curb) restricted zone may allow for additional landscaping and street furniture.



Crossing of Maple Street at Cedar Street

Recommendation 3.2: Signage

Bike route and/or custom signage should be added along this segment.

Recommendation 3.3: Shared Lane Markings

Add two to three shared lane markings per block per direction in this segment.

Recommendation 3.4: Parking Stripes

Add parking stripes to delineate the parking area on both sides of the street.

Recommendation 3.5 Traffic Calming

Speed humps and/or traffic diversion should be considered in this segment.

Recommendation 3.6: Landscaping

Shade producing street trees should be added wherever possible. Empty tree wells and underutilized parkways should be used to plant shade producing trees along the route.



Empty tree well



Underutilized parkway

Segment #4: Maple Street between Chevy Chase Drive and Verdugo Road

This segment is characterized by single-family homes and low traffic volumes, and sporadic shade.

Recommendation 4.1: Signage

Bike route and/or custom signage should be added along this segment.

Recommendation 4.2: Shared Lane Markings

Add two to three shared lane markings per block per direction in this segment.

Recommendation 4.3: Parking Stripes

Add parking stripes to delineate the parking area on both sides of the street.

Recommendation 4.4: Centerline Striping

Add or rehabilitate the solid/dashed yellow centerline stripe.

Recommendation 4.5: Traffic Calming

Speed humps should be considered in this segment. Several intersections are wide with large turning radii including Wing Street, Porter Street and Fischer Street. Mini traffic circles should be considered at these locations.



Potential traffic circle locations

Recommendation 4.6: Landscaping

Shade producing street trees should be added to the underutilized parkways (landscaped strips) along this segment.

Segment #5: Rock Glen Avenue between Verdugo Road and Lincoln Avenue

This segment includes excellent shade cover from mature street trees, making the route pleasant for walking and cycling even in hot weather. The current roadway is narrow (30') with parking on both sides and relatively low observed traffic volumes. Centerline striping is not recommended due to the narrow curb to curb widths. The traffic signal at Verdugo Road appears to be on a timer, making bicycle detection unnecessary. A non-motorized undercrossing of the Glendale Freeway (SR-2) could potentially provide a connection to the City of Los Angeles in the long term, but further study would be required to determine feasibility.



Rock Glen Avenue



Terminus of Rock Glen Avenue at Glendale Freeway

Recommendation 5.1: Signage

Bike route and/or custom signage should be added along segment.

Recommendation 5.2: Shared Lane Markings

Add two to three shared lane markings per block per direction in this segment.

Recommendation 5.3: Parking Stripes

Add parking stripes to delineate the parking area on both sides of the street.

Recommendation 5.4: Traffic Calming

Speed humps should be considered in this segment, but are not crucial in the near term.

Segment #6: Lincoln Avenue between Rock Glen Avenue and Colorado Street

The current roadway is narrow (30') with parking on both sides and relatively low observed traffic volumes. Centerline striping is not recommended due to the narrow curb to curb widths. The route ends at an existing crosswalk with flashing beacons in the pavement and warning signage to connect users to Carr Park.



Crosswalk at Lincoln Avenue and Colorado Street

Recommendation 6.1: Signage

Bike route and/or custom signage should be added along this segment.

Recommendation 6.2: Shared Lane Markings

Add two to three shared lane markings per block per direction in this segment.

Recommendation 6.3: Parking Stripes

Add parking stripes to delineate the parking area on both sides of the street.

Recommendation 6.4: Traffic Calming

Speed humps should be considered in this segment, but are not crucial in the near term.

Recommendation 6.5: Landscaping

Shade producing street trees should be added wherever possible through the addition of new tree wells and/or landscaped strips.