

Attachment 1

CITY of BEVERLY HILLS

Robertson Boulevard Angled Parking Feasibility Study



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Prepared For:





INTRODUCTION

The City of Beverly Hills would like to explore the feasibility of implementing angled parking on South Robertson Boulevard between Whitworth Drive and Wilshire Boulevard within the city limits to enhance the visitor experience and potentially increase the supply of on-street parking. This study is intended to serve as a high level review of angled parking concepts for Robertson Boulevard based on the roadway characteristics and available right-of-way. This report summarizes the existing roadway characteristics and parking configuration along Robertson Boulevard and offers three preliminary design concepts for the City's consideration.

EXISTING CONDITIONS

The existing roadway characteristics of Robertson Boulevard between Whitworth Drive and Wilshire Boulevard were reviewed based on aerial photographs and a field visit. The existing right-of-way, lane configurations, traffic controls, on-street parking, driveways and mid-block pedestrian crosswalks were documented, as summarized below and shown in Figure 1.

- Robertson Boulevard within the City of Beverly Hills has a 54-foot cross-section with two travel lanes in each direction, parallel parking on both sides of the street (155 spaces) and exclusive left-turn lanes at the two major intersections in the study area (Olympic & Wilshire Boulevards).
- Robertson Boulevard is classified as a "Minor Arterial Street" in the City's General Plan¹, which places more emphasis on land access than principal arterials. A minor arterial street does not always have exclusive left-turn lanes at cross street intersections due to narrow rights-of-way and the need to provide on-street parking.
- The portion of Robertson Boulevard in the study area has high peak period traffic volumes, with two major arterial intersections that currently operate at Level of Service (LOS) D at Robertson Boulevard & Wilshire Boulevard and LOS E at Robertson Boulevard & Olympic Boulevard during the weekday commute periods².
- One bus line operates on Robertson Boulevard³ (Line 220 connecting to the Expo LRT Culver City Station). A total of 28 buses run on a typical weekday with 14 buses in each direction.

¹ City of Beverly Hills General Plan Updated Technical Background Report

<http://www.beverlyhills.org/cbhfiles/storage/files/filebank/2574--GP-TBR-Chp-3-8.pdf>

² Westside Subway Extension FEIR shows that the existing intersection LOS is LOS D during the weekday AM and PM peak hours at Robertson Boulevard & Wilshire Boulevard and at LOS E during the weekday AM and PM peak hours at Robertson Boulevard & Olympic Boulevard. http://www.metro.net/projects_studies/westside/images/final_eir-eis/44.%20Existing%20plus%20Project%20Traffic%20Impact%20Analysis%20Report.pdf

³ Metro website at <http://www.metro.net/around/maps/>



FACTORS AND CONSTRAINTS

The following factors and constraints were identified to inform the design concepts for Robertson Boulevard:

- Existing roadway classification
- Roadway width, number of travel lanes, and operating conditions
- Transit routes and frequency of service
- City of Los Angeles 2010 Bicycle Plan⁴

PROPOSED CORRIDOR CONCEPTS FOR ROBERTSON BOULEVARD

Based on the available right-of-way on Robertson Boulevard, three design concepts were developed, including two designs featuring angled parking on the west side of the street. Since angled parking would only be feasible on one side of the street due to available right-of-way, the west side was chosen for implementation because fewer driveways are located on the west side of the roadway than the east side (Figure 1 shows the driveways located along Robertson Boulevard) and the western parcels are located within the City of Beverly Hills whereas the eastern parcels are in the City of Los Angeles. The third design concept would maintain the parallel parking and provide a “complete streets” design with on-street bike lanes and a center turn lane to reduce vehicular travel speeds, reduce delays caused by vehicles making a left-turn along the corridor, and improve access for active modes.

With a 54-foot cross-section, angled parking would be possible on only one side of Robertson Boulevard and would require a reduction of travel lanes from two travel lanes to one travel lane in each direction. Therefore, the original request to retain two northbound travel lanes is not feasible. Based on the characteristics of Robertson Boulevard, a typical parking stall angled at 45 degrees from the curb and with front-in operations would take the least amount of right-of-way while allowing cars to park and maneuver safely. A 9.5-foot buffer lane would be located adjacent to the angled parking lane to allow cars to enter and exit the parking spaces without disrupting through traffic along Robertson Boulevard. During peak travel periods, vehicles may choose to drive in this lane; however, since vehicles would experience frequent delays due to vehicles entering and exiting the angled parking spaces, this lane has been identified as a “buffer area” and not a vehicular travel lane.

Robertson Boulevard between Wilshire Boulevard and Whitworth Drive currently has 155 on-street metered parking spaces, as shown in Figure 1. Table 1 summarizes the estimated on-street parking for existing conditions and each design concept. Figures 2, 3, and 4 illustrate the cross-sections and the benefits and constraints for each concept compared to the existing configuration.

⁴ Los Angeles Department of City Planning 2010 Bicycle Plan
<http://planning.lacity.org/cwd/gnlpln/transelt/NewBikePlan/Txt/LA%20CITY%20BICYCLE%20PLAN.pdf>



The following summarizes the key features for each design concept:

- Concept A – Maximize On-Street Parking (Angled Parking): This option would provide angled parking on the west side of the street for the entire study corridor, which would provide approximately 69 additional parking spaces, resulting in a 45 percent increase in on-street parking along the corridor. Implementing angled parking would require the number of travel lanes to be reduced from two lanes to one lane in each direction. The two existing travel lanes would merge into one lane on the northern end of the segment just south of Wilshire Boulevard and on the southern end of the segment just north of Whitworth Drive. Figure 2 illustrates the cross-section and summarizes the benefits and constraints for this concept.

Corridor Segment	Existing Parallel Parking		Concept A Angled Parking		Concept B Angled Parking for Select Blocks		Concept C Complete Streets	
	West	East	West	East	West	East	West	East
Curbside	West	East	West	East	West	East	West	East
Wilshire Blvd to Charleville Blvd	11	12	25(A)*	12	11	12	11	12
Charleville Blvd to Gregory Wy (N)	22	13	41 (A)	13	41 (A)	13	22	13
Gregory Wy (N) to Gregory Wy (S)	4	8	7 (A)	8	7 (A)	8	4	8
Gregory Wy (S) to Chalmers Dr	17	13	29 (A)	13	29 (A)	13	17	13
Chalmers Dr to Olympic Blvd	12	10	22 (A)	10	12	10	12	10
Olympic Blvd to Whitworth Dr	18	15	29 (A)*	15	18	15	18	15
Total On-Street Parking Spaces by Direction	84	71	153 (A)	71	118	71	84	71
Total On-Street Parking Spaces	155		224		189		155	
Net Change in Total Parking Count	-		69		34		0	
Percent Change in Total Parking Count	-		+45%		+22%		-	

Note: (A): Angled Parking; assumes 45-Degree front-in angled parking on Robertson Boulevard.



- **Concept B – Balance On-Street Parking Supply with Roadway Capacity (Angled Parking for Select Blocks):** This hybrid option would provide angled parking on the west side of the street along the middle section of Robertson Boulevard from Charleville Boulevard to Chalmers Drive where additional on-street parking can serve the adjacent retail uses. This concept would provide approximately 34 additional on-street parking spaces, resulting in a 22 percent increase in the on-street parking supply along the corridor. The roadway capacity would be maintained along the northern and southern ends of Robertson Boulevard where it connects with major intersections at Wilshire and Olympic Boulevards. The roadway would be reduced to one travel lane in each direction in the areas designated for angled parking. Figure 3 illustrates the cross-section and summarizes the benefits and constraints for this concept.
- **Concept C – Complete Streets (Maintain Parallel Parking and Provide Bike Lanes):** This option would provide one travel lane in each direction, a center turn lane to reduce delays caused by vehicles turning left, and Class II bicycle lanes on both sides of the street. Currently, there are no left-turn lanes at intersections or mid-block along Robertson Boulevard between Wilshire Boulevard and Olympic Boulevard. A left-turn vehicle intending to turn onto a side street could result in a queue on Robertson Boulevard during peak periods, and the addition of a center turn lane would facilitate the left-turn movement into properties on both sides of the corridor. This option would retain the parallel parking on both sides of Robertson Boulevard. Figure 4 illustrates the cross-section and summarizes the benefits and constraints for this concept.

Concept A and Concept B would provide additional angled parking for the Robertson Boulevard corridor. Concept C introduces new bike lanes to the corridor and adds a center turn lane to reduce delays caused by left turning vehicles along the corridor. Due to the high traffic volumes along Robertson Boulevard, the removal of vehicular lanes could result in congestion and potential shifts in traffic volumes to adjacent streets.

BACK-IN ANGLED PARKING

The feasibility of other angled parking options less than 45-degree, such as 30-degree parking with front-in operations, was also explored. However, 30-degree angled parking with front-in operations is not recommended due to the potential difficulty that drivers, particularly older drivers, have when backing into moving traffic. Therefore, parking angled at less than 45 degrees would operate more safely with back-in operations. Back-in angled parking provides motorists with better visibility of bicyclists, pedestrians, cars and trucks as they exit a parking space and enter moving traffic. Back-in angled parking is usually recommended for “non-arterial” streets as a traffic calming measure for locations where speeding is a problem and increased parking is needed. Given the high traffic volumes on Robertson Boulevard, implementation of back-in operations would require further investigation and engineering design review.



TRAFFIC OPERATIONS

The angled parking concepts presented above would all require some amount of travel lane reduction along Robertson Boulevard. To maximize the amount of on-street parking under Concept 1, Robertson Boulevard would be reduced from two to one travel lanes in each direction along the entire study corridor. To provide additional vehicular capacity at the two major intersections along the study corridor, angled parking was only recommended along select blocks of Robertson Boulevard under Concept 2.

Any reduction in travel lanes along Robertson Boulevard would increase the amount of congestion along the corridor during peak travel hours. Existing traffic volumes (from counts collected in 2009) are reported below.

Traffic volume on Robertson Boulevard just south of Wilshire Boulevard:

- Northbound: AM Peak Hour - 910; PM Peak Hour - 835
- Southbound: AM Peak Hour - 805; PM Peak Hour - 1,030

Traffic volume on Robertson Boulevard just north of Olympic Boulevard:

- Northbound: AM Peak Hour – 1,005 vehicles; PM Peak Hour - 905
- Southbound: AM Peak Hour – 825 vehicles; PM Peak Hour - 895

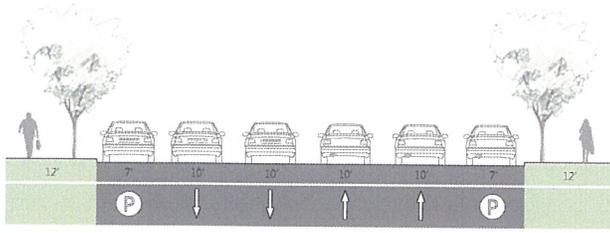
As shown above, between 800 and 1,000 vehicles travel along Robertson Boulevard in each direction in the peak hour. These volumes exceed the capacity of a single travel lane in both directions for an urban area. A reduction in travel lanes along the corridor would increase congestion along Robertson Boulevard and likely result in a shift of vehicles to parallel corridors.

CONCLUSIONS & NEXT STEPS

In summary, it is possible to replace parallel parking with angled parking on the west side of Robertson Boulevard while retaining parallel parking on the east side of Robertson Boulevard. Such a configuration would require the removal of one travel lane in each direction. Three corridor concepts were presented in this report for the City's consideration. Concepts A and B provide additional angled parking for the Robertson Boulevard corridor. Concept C introduces new bikes lanes and a center turn while maintaining the existing parallel parking. In all three concepts, the removal of vehicular lanes could result in increased congestion and potential shifts in traffic to adjacent streets.

This study was intended to serve as a high level review of angled parking concepts for Robertson Boulevard based on the roadway characteristics and available right-of-way. If the City of Beverly Hills would like to continue to explore angled parking along this corridor, we recommend that a detailed traffic operations study be conducted to determine the potential LOS impacts along Robertson Boulevard and potential impacts caused by vehicles diverting from Robertson Boulevard into the adjacent neighborhood during peak travel periods with the reduction in roadway capacity.

54' Roadway Width
4 Travel Lanes & 2 Lanes Parallel Parking



Benefits

- No change to existing conditions

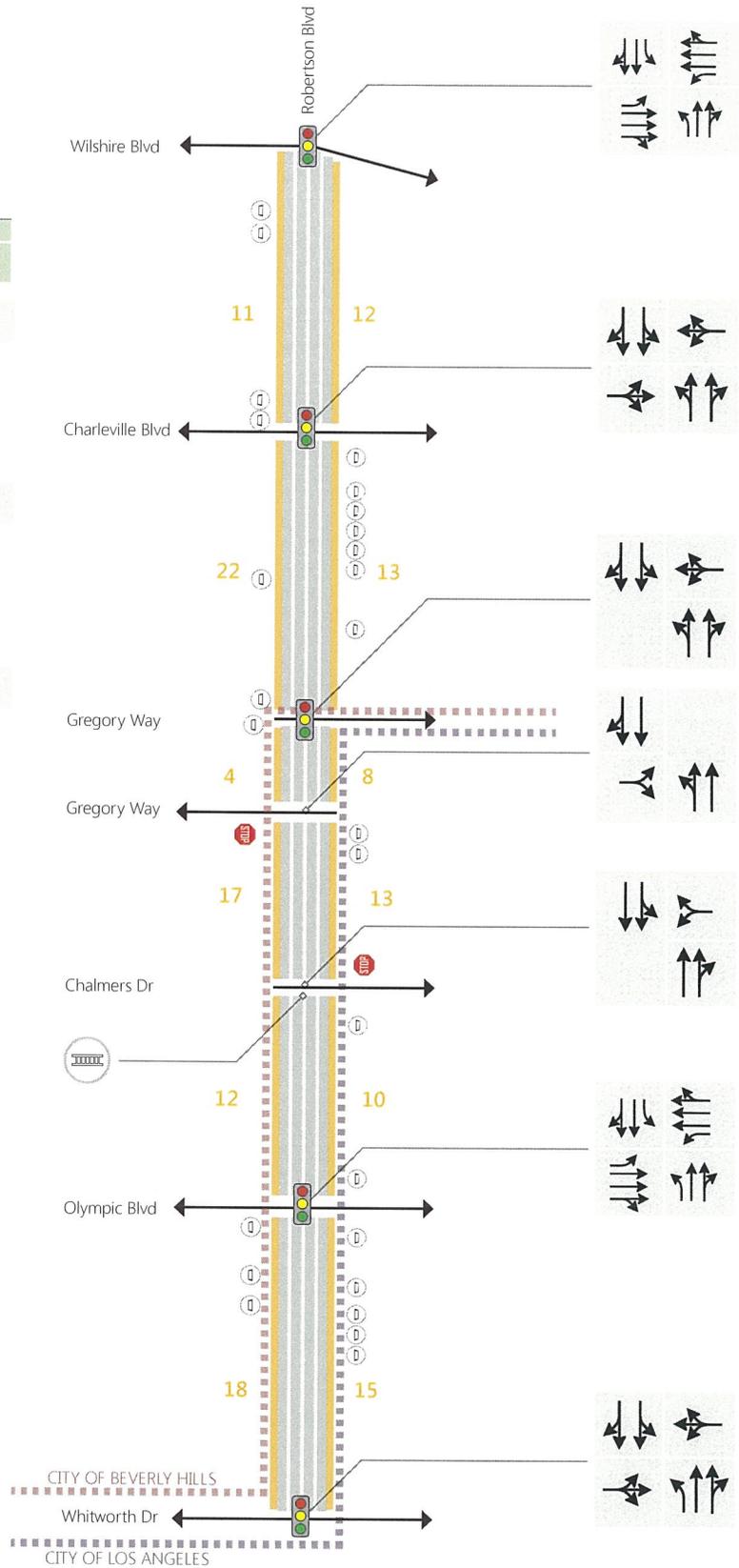
Constraints

- No parking space gain

Total Parking Spaces: 155

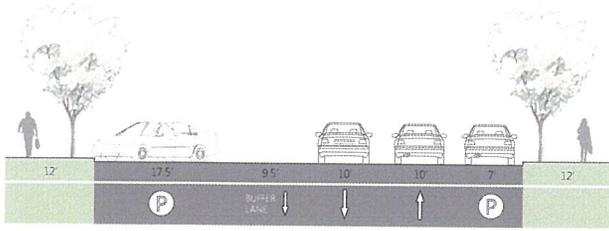
- Travel Lane
- 1 Hour Parking 8 AM - 6 PM (Parallel)
- Signalized Intersection
- Stop Sign Location
- Driveway
- # of Parking Spaces on Segment
- High-Visibility Crosswalk

NOT TO SCALE



Not to Scale

54' Roadway Width
2 Travel Lanes, Angled Parking on West Side,
Buffer Lane, Parallel Parking on East Side



Benefits

- Gain 69 additional parking spaces (45% increase)
- Provision of space for potential curb extensions at intersections and mid-block crosswalk, which will reduce pedestrian crossing distance and improve pedestrian visibility
- A wider parking buffer between pedestrians on the west side of the street and through traffic

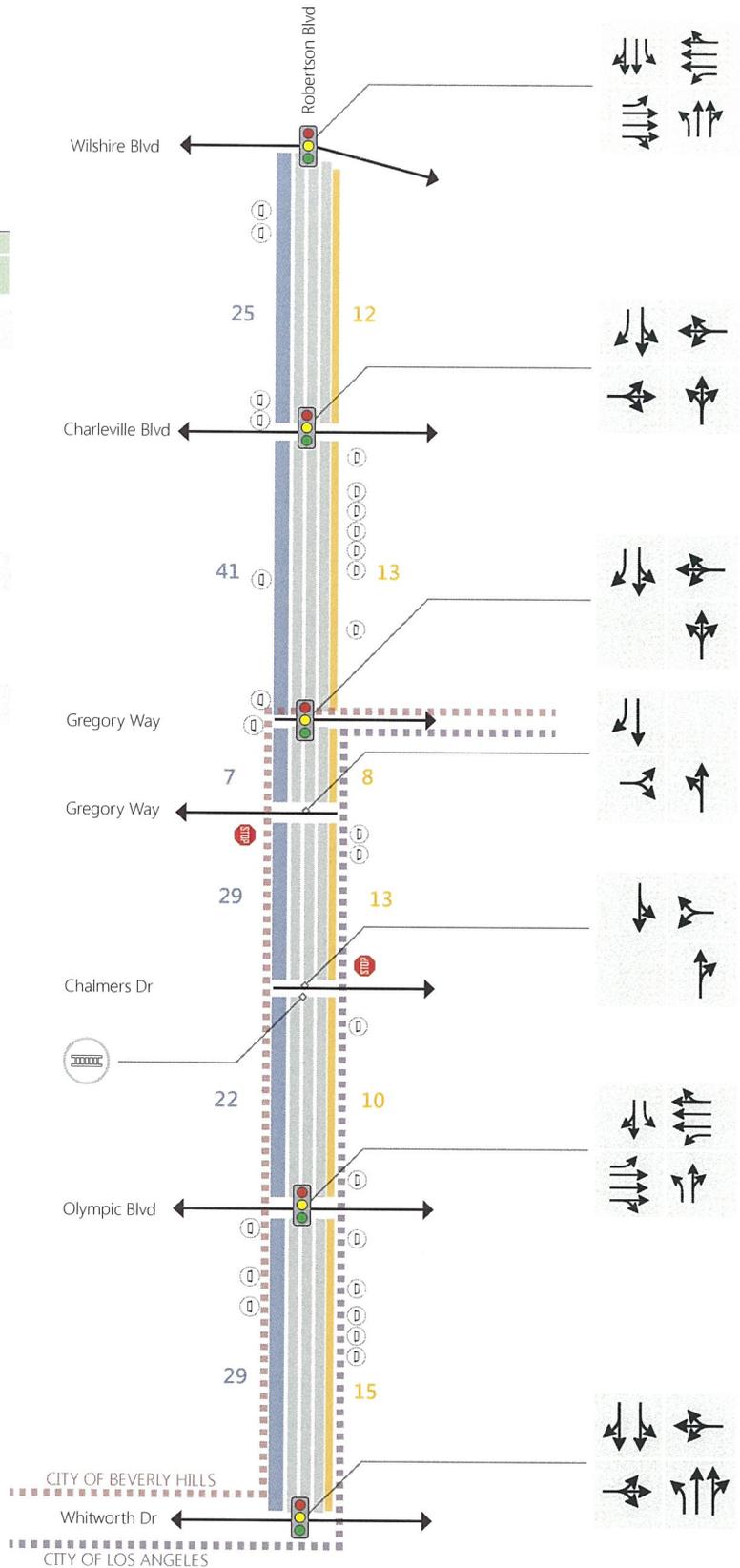
Constraints

- Lose one travel lane in each direction
- Could result in high peak period congestion

Total Parking Spaces: 224

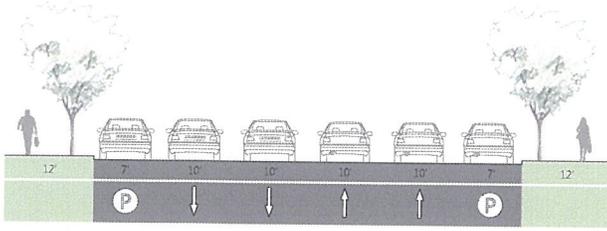
- Travel Lane
- 1 Hour Parking 8 AM - 6 PM (Angled)
- 1 Hour Parking 8 AM - 6 PM (Parallel)
- Signalized Intersection
- Stop Sign Location
- Driveway
- # of Parking Spaces on Segment
- High-Visibility Crosswalk

NOT TO SCALE

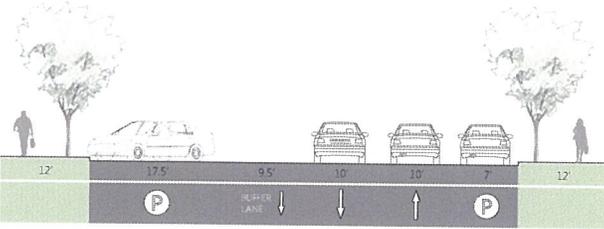


Not to Scale

**1 54' Roadway Width
4 Travel Lanes & 2 Lanes Parallel Parking**



**2 54' Roadway Width
2 Travel Lanes, Angled Parking on West Side,
Buffer Lane, Parallel Parking on East Side**



Benefits

- Gain 34 additional parking spaces (22% increase)
- Provision of space for potential curb extensions at intersections and mid-block crosswalk, which will reduce pedestrian crossing distance and improve pedestrian visibility
- A wider parking buffer between pedestrians and through traffic on blocks with angled parking
- Minimize vehicle impacts on blocks that maintain parallel parking

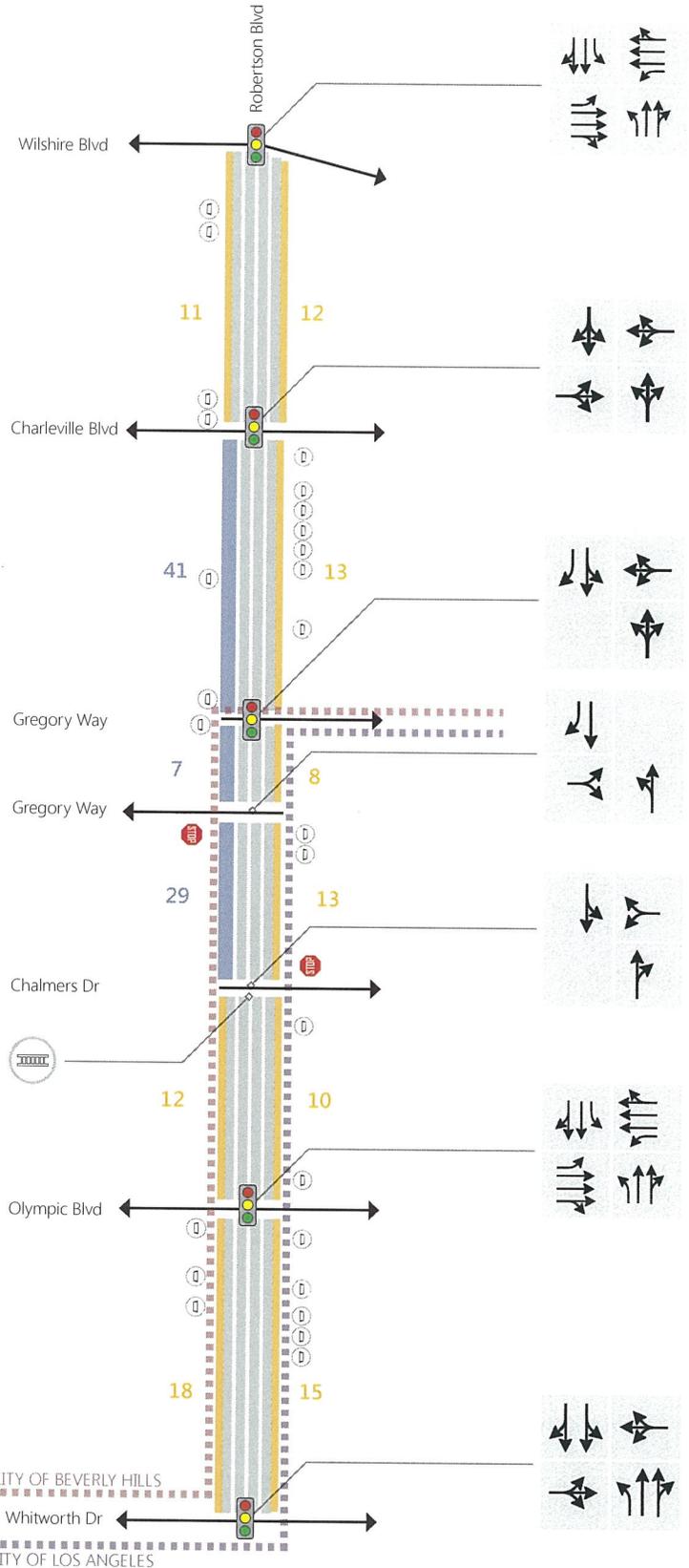
Constraints

- Lose one travel lane in each direction for selected blocks
- Could result in high peak period congestion on blocks with angled parking

Total Parking Spaces: 189

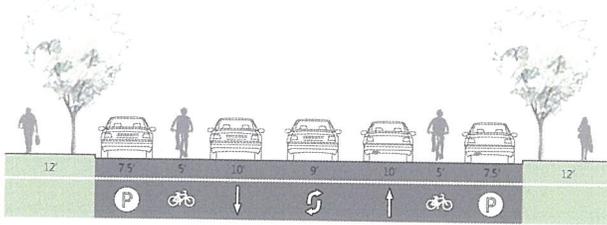
- Travel Lane
- 1 Hour Parking 8 AM - 6 PM (Angled)
- 1 Hour Parking 8 AM - 6 PM (Parallel)
- Signalized Intersection
- Stop Sign Location
- Driveway
- # of Parking Spaces on Segment
- High-Visibility Crosswalk

NOT TO SCALE



Not to Scale

54' Roadway Width
2 Travel Lanes, Center Turn Lane, 2 Lanes
Parallel Parking, 2 Bike Lanes



Benefits

- Reduce traffic speeds
- Additional left turn capacity at driveways and at intersections
- Would allow for implementation of City of Los Angeles bike lanes per 2010 Bike Master Plan

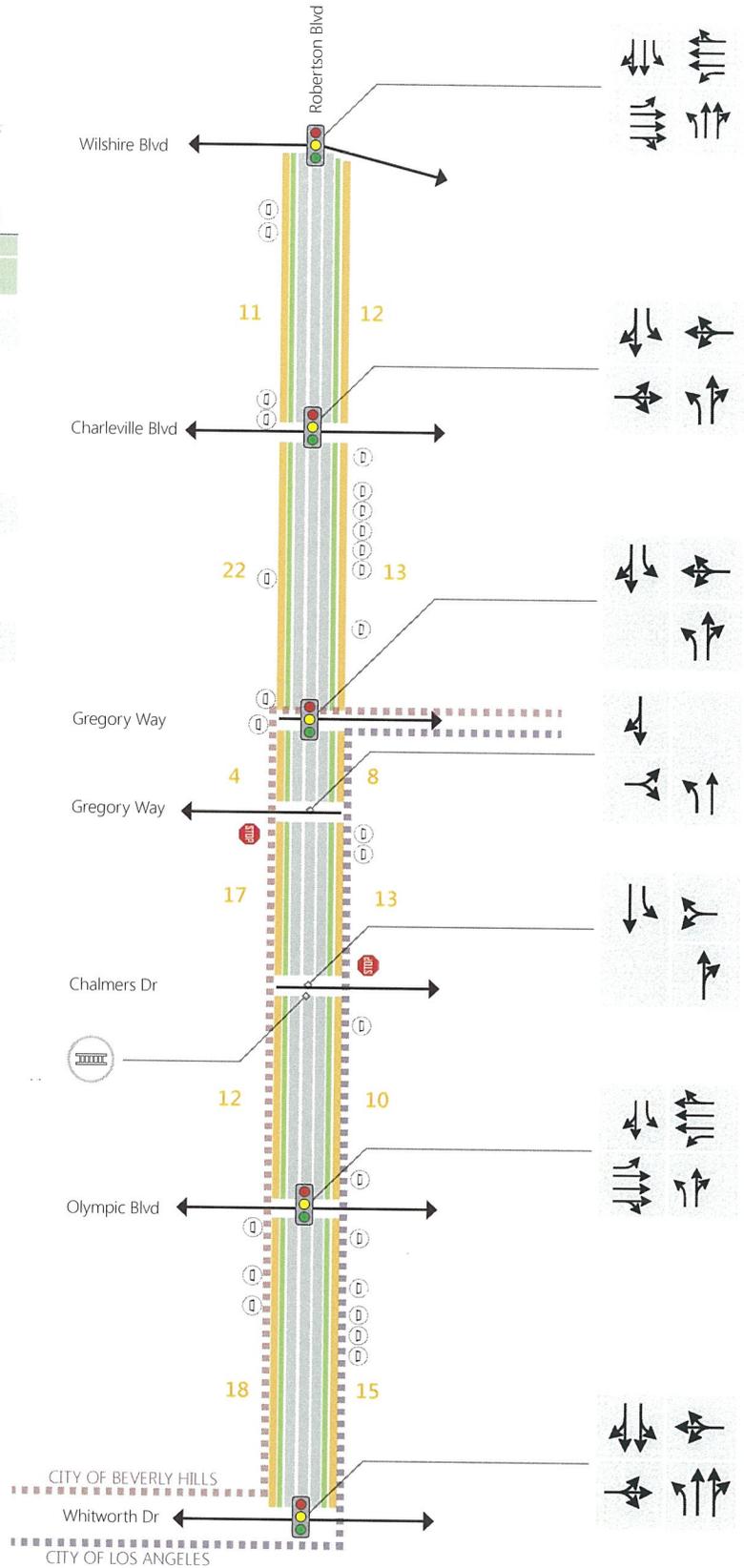
Constraints

- Lose one travel lane in each direction; could result in high peak period congestion

Total Parking Spaces: 155

- Travel Lane
- 1 Hour Parking 8 AM - 6 PM (Parallel)
- Bike Lane
- Signalized Intersection
- Stop Sign Location
- Driveway
- # of Parking Spaces on Segment
- High-Visibility Crosswalk

NOT TO SCALE



Not to Scale