Newport Heights Neighborhood School Traffic Study

Prepared for:
The City of Newport Beach

May, 2018

Kimley»Horn

NEWPORT HEIGHTS NEIGHBORHOOD SCHOOL TRAFFIC STUDY IN THE CITY OF NEWPORT BEACH

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INTRODUCTION

This School Traffic Study has been prepared to evaluate the school-related traffic flows to/from the three schools within the Newport Heights area as well as the current drop-off / pick-up operations. The report will summarize the data collected and provide recommended measures to consider for implementation.

PROJECT DESCRIPTION

The Newport Heights area of Newport Beach is a residential area that is home to three schools within the Newport-Mesa Unified School District (Newport Heights Elementary, Ensign Intermediate School and Newport Harbor High School). At the beginning and end of each school day, the neighborhood streets experience a heavy concentration of students and parents associated with each school. The City of Newport Beach (City) has retained Kimley-Horn to evaluate the school-related traffic flows to and from the schools, as well as the current drop-off / pick-up operations. The study area is presented in its regional setting on Figure 1.

The City identified an initial list of study intersection and roadway segments. The list was expanded following a public meeting conducted on November 16, 2017. The list was further expanded following a second public meeting conducted on March 14, 2018. The study intersections and roadway segments selected for data collection and observations are presented on Figure 2.

The following observations and data collection was conducted within the Newport Heights area:

- Field observations of current drop-off / pick-up operations
- Intersection turning movement counts
  (Including school-related pedestrian crossings and bicycle counts)
- Midblock pedestrian, bicycle, and skateboard counts at select locations
- Review and inventory of school signage
- Review of crossing guard locations
- Parking counts
- Speed data
- Sight distance analysis at unsignalized intersections along 15th Street
  (Existing red curb marking locations were noted)

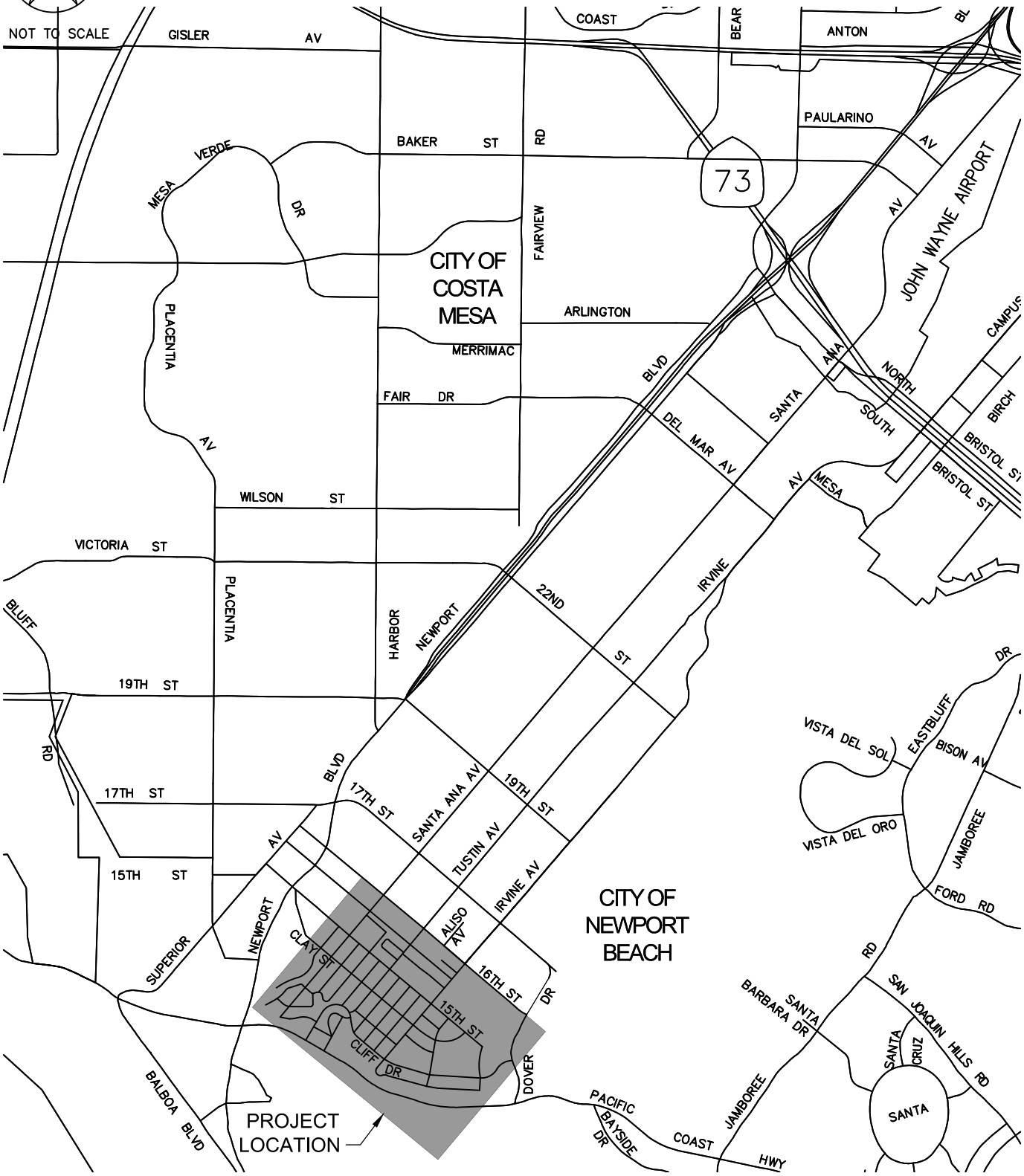


FIGURE 1
VICINITY MAP

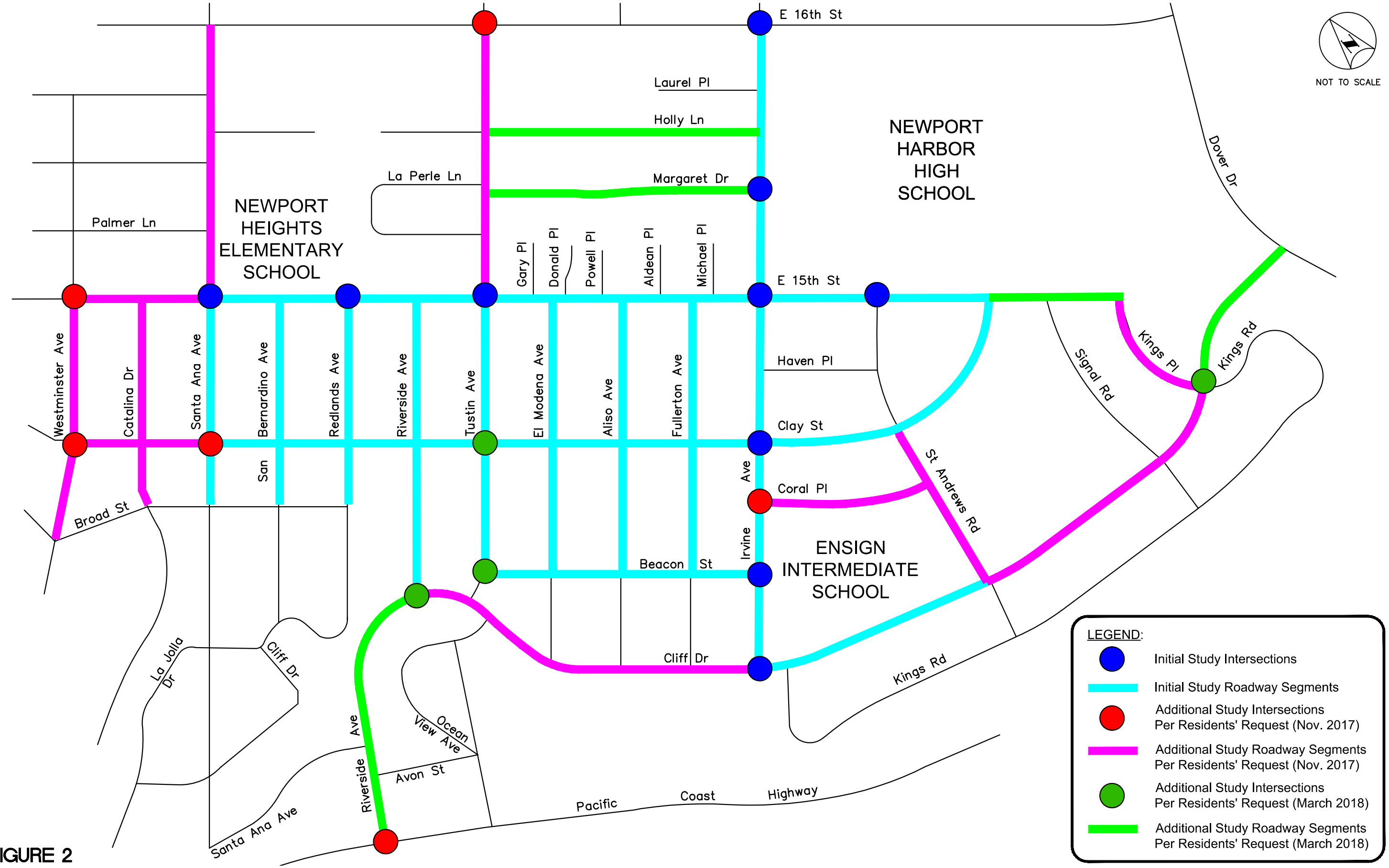


FIGURE 2
STUDY AREA

EXISTING TRAFFIC CONDITIONS

This section summarizes the existing roadway circulation network, field observations at each of the three schools during drop-off and pick-up operations, peak-hour vehicular, pedestrian, and bicycle traffic volumes, as well as midblock pedestrian, bicycle, and skateboard traffic volumes.

Existing Street System

The following provides a description of the existing street system in the Newport Heights Neighborhood. Roadway classifications are taken from the City of Newport Beach Circulation Element.

Clay Street is a two-lane residential street with one travel lane in each direction. Painted centerline striping exists between Westminster Avenue and Riverside Avenue, and between Irvine Avenue and 15th Street. Clay Street runs in the east-west direction and has a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of the street. There is curb and gutter on both sides of the road, but no sidewalks are present, with the exception of St. Andrews Road to 15th Street where there is existing sidewalk on the north side.

Irvine Avenue is a four-lane undivided secondary roadway with two travel lanes in each direction between 15th Street and 16th Street, adjacent to Newport Harbor High School per the City's Circulation Element. Irvine Avenue runs in the north-south direction and has a curb-to-curb width of 64 feet. Irvine Avenue, between Cliff Drive and 15th Street, is a two-lane residential street with one travel lane in each direction and a painted centerline stripe. Curb-to-curb width is 38 feet in this section. Class II bike lanes are present on both sides of the street and on-street parking is allowed on both sides of the street. There is curb and gutter on both sides of the street. There are sidewalks available on both sides of the street north of 15th Street. Sidewalk continues only on the east side of the street from 15th Street to Beacon Street.

15th Street is a two-lane residential street with one travel lane in each direction and a painted centerline striping. 15th Street runs in the east-west direction and has a curb-to-curb width of 38 feet. On-street parking is allowed on both sides of the street. There is curb and gutter and sidewalk on both sides of the street between Santa Ana Avenue and Irvine Avenue. The north side of 15th Street between Redlands Avenue and Tustin Avenue is within the City of Costa Mesa boundary.

16th Street is a two-lane undivided secondary roadway with one travel lane in each direction and a painted median between Irvine Avenue and Dover Drive, adjacent to Newport Harbor High School per the City's Circulation Element. 16th Street runs in the east-west direction and has a curb-to-curb width of 64 feet. Between Tustin Avenue and Irvine Avenue, 16th Street is a two-lane residential street with one travel lane in each direction and a painted centerline striping. Curb-to-curb width is 38 feet in this section. On-street parking is allowed on both sides of the street. There is curb, gutter and sidewalk on both sides of the street.

Cliff Drive a two-lane residential street with one travel lane in each direction. A painted centerline stripe is present with short sections of raised median. Cliff Drive runs in the east-west direction and has a curb-to-curb width of 58 feet. Adjacent to the edge of travelled way are Class II bike lanes, then on-street parking on both sides of the street. There is curb and gutter on both sides of the road, but sidewalk is only present on the north side of the street, adjacent to Ensign Intermediate School.

Santa Ana Avenue is a two-lane residential street with one travel lane in each direction and painted centerline striping. Santa Ana Avenue runs in the north-south direction and has a curb-to-curb width of 40 feet north of 15th Street and 56 feet south of 15th Street. On-street parking is allowed on both sides of the street. There is curb, gutter and sidewalk on both sides of the street north of 15th Street. There is no sidewalk on either side of the street south of 15th Street.

Catalina Drive, San Bernardino Avenue, Redlands Avenue, Riverside Avenue, Tustin Avenue, El Modena Avenue, Aliso Avenue, and Fullerton Avenue are two-lane residential streets with one travel lane in each direction. These streets run in the north-south direction and have a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of the street. There are curb and gutter but no sidewalk. North of 15th Street, Tustin Avenue is within the City of Costa Mesa boundary.

Westminster Avenue is a two-lane residential street with one travel lane in each direction. This street runs in the north-south direction and has a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of the street. There is curb and gutter on both sides of the street. Sidewalk is only available in some locations on either side of the street.

Holly Lane and Margaret Drive are two-lane residential streets with one travel lane in each direction. These streets run in the east-west direction and have a curb-to-curb width of 35 feet. On street parking is allowed on both sides of each street and permitted for residents only during school hours. There is curb and gutter on both sides of each road, but no sidewalks are present.

Beacon Street is a two-lane residential street with one travel lane in each direction. Beacon Street runs in the east-west direction and has a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of the street. There is curb and gutter on both sides of the road, but no sidewalks are present.

Coral Place is a two-lane residential street with one travel lane in each direction. Coral Place runs in the east-west direction and has a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of each street. There is curb and gutter on both sides of each street with sidewalk only on the north side.

St. Andrews Road and Kings Place/Kings Road are two-lane residential streets with one travel lane in each direction with painted centerline striping. They have a curb-to-curb width of 36 feet. On-street parking is allowed on both sides of each street. There is curb and gutter on both sides of each street, but no sidewalk present.

Field Observations of Current Drop-off/Pick-up Operations

Field observations were conducted during the month of October 2017 at each of the three schools in the Newport Heights Neighborhood:

- Newport Heights Elementary School
- Ensign Intermediate School
- Newport Harbor High School

Observations were conducted during each of the drop-off and pick-up times corresponding to each of the school's start and end times. The following are the typical start and end times for each school and the drop-off and pick-up times observed:

- Newport Heights Elementary School hours (8:00 AM – 2:50 PM)
  - Drop-off 7:00 – 8:00 AM,
    Pick-up 1:30 – 3:30 PM (covers staggered pick-up for all grades)
- Ensign Intermediate School hours (8:05 AM – 2:40 PM)
  - Drop-off 7:05 – 8:05 AM, Pick-up 2:15 – 3:30 PM
- Newport Harbor High School hours (8:00 AM – 3:05 PM)
  - Drop-off 7:00 – 8:00 AM, Pick-up 2:30 – 3:30 PM

Newport Heights Elementary School

Drop-off

School begins (bell rings) at 8:00 AM
Period of observation: 7:00 – 8:15 AM
Observations:

- 7:15 AM - Some students on bikes and skateboards were observed traveling eastbound on 15th Street towards the middle and high school; mostly high school students, based on travel patterns.
- Crossing guards were present from 7:15 – 8:15 AM at:
  - Redlands Avenue at 15th Street
  - Santa Ana Avenue at Palmer Street
- 7:30 AM – Drop-off began inside parking lot in designated drop-off area.
- Parents were observed parking on the north side of 15th Street, east of the parking lot driveway to drop off or walk children to school. This area is designated "No drop-off/pick-up area" on the school's website.
- Children were being dropped off on the south side of 15th Street, then jaywalking across the street. In some instances, parents crossed the street with their child.
- On-street parking was full along both sides of 15th Street between Santa Ana Avenue and Redlands Avenue for the entire period between 7:30 AM and 8:00 AM (prior to the start of school). This area cleared completely after 8:10 AM.

- Parents also parked on neighborhood streets or alleys along 15th Street to walk children to school.
    - Parents observed parking on San Bernardino Avenue would typically jaywalk.
    - Parents observed parking on Redlands Avenue would typically use the crosswalk at Redlands Avenue.
- Parents utilized the bus zone along Santa Ana Avenue to drop-off their children after the bus left the area.
- Parents traveling southbound on Santa Ana Avenue also parked on the west side of the street just north of the intersection to drop off their children.
- Typical jaywalking locations were:
    - 15th Street between Santa Ana Avenue and the alley east of the intersection
    - 15th Street between San Bernardino Avenue and Redlands Avenue
- Multiple vehicles were observed making illegal eastbound U-turns past the raised median in front of school driveway.

Pick-up

School ends (bell rings) at 2:45 PM (1st – 3rd grade) and 2:50 PM (4th – 6th grade)
Period of observation: 2:00 – 3:00 PM
Observations:

- Around 2:45 PM, vehicles waiting in the designated pick-up area in the school parking lot queued out of the school driveway and spilled out onto 15th Street. Parents were observed parking in empty parking lot spaces.
- A school faculty member was observed directing traffic near the exit of the staff parking lot to allow cars to exit, due to the long queue of cars on 15th Street.
- Multiple westbound-traveling vehicles on 15th Street were observed stopping in the travel lane to pick up their child.
- Vehicles were parallel parking and halting traffic on 15th Street to wait for their children.
- Number of jaywalkers observed: 10
    - Parents were commonly seen parking on San Bernardino Avenue and jaywalking across 15th Street to pick up their children.
    - Parents were also observed parking on the west side of Santa Ana Avenue (across the street from the school) and jaywalking to pick up their children.
- Two bicyclists were observed not adhering to the Stop control at Redlands Avenue.

Ensign Intermediate School

Drop-off

School begins (bell rings) at 8:00 AM
Period of observation: 7:00 AM – 8:30 AM
Observations:

- The main entrances to the campus are:
    - Near the intersection of Irvine Avenue at Beacon Street.
    - The bicycle rack gate located on the southeast corner of Irvine Avenue at Coral Place.

    - Along Cliff Drive east of Irvine Avenue and the teacher/drop-off parking lot.
- Heavy bicycle activity was observed entering the Beacon Street and Coral Place entrances.
    - Most bicyclists (approximately 80%) travel southbound on Irvine Avenue north of the school. A good portion are coming from southbound Tustin Avenue to eastbound Clay Street before joining on Irvine Avenue.
    - The remaining 20% travel eastbound on Beacon Street.
- On Irvine Avenue, bicyclists heading southbound toward the school were observed utilizing the east side sidewalk and biking in the bike lane on the northbound side of the street.
- Heavy pedestrian activity enters the Beacon Street and Coral Place entrances.
    - Most pedestrians (approximately 70%) travel eastbound on Beacon Street.
    - The remaining 30% travel southbound on Irvine Street.
- There is no sidewalk on either side of Beacon Street, so pedestrians and bicyclists share the road with vehicles.
- Beacon Street is used as a drop-off area. Pedestrians walk on the street, since there are no sidewalks, then cross at the crosswalk at Irvine Avenue.
- A crossing guard is posted at the intersection of Beacon Street at Irvine Avenue.
- Illegal drop-offs were observed along the east side of Irvine Avenue between Cliff Drive and Beacon Street as well as the north side and south side of Cliff Drive, east of Irvine Avenue.
    - There are existing "NO STOPPING, 7AM-9AM, SCHOOL DAYS" signs posted along the east side of Irvine Avenue from Cliff Drive to Beacon Street.
    - Existing "NO STOPPING, 7 AM-9 AM, SCHOOL DAYS" signs are also posted along the west side of Irvine Avenue, north of Beacon Street.

<u>Pick-Up</u>

School ends (bell rings) at 2:40 PM

Period of observation: 2:15 PM – 3:30 PM

Observations:

- Vehicles lined up along both sides of Cliff Drive before school release.
    - There was some observed double parking along the north side of Cliff Drive.
    - Students were observed jaywalking across Cliff Drive to cars parked on the south side of Cliff Drive.
- Illegal quick pick-ups were observed along both sides of Irvine Avenue and Cliff Drive.
- Heavy bike activity was observed leaving the Beacon Street and Coral Place entrances
    - There is a similar trend of travel as the AM (80% travel northbound on Irvine Avenue and 20% travel westbound on Beacon Street). Of the northbound bicyclists on Irvine Avenue, approximately one-third turn westbound on Clay Street.
- Heavy pedestrian activity leaves the Beacon Street and Coral Place entrances
    - There is a similar trend of travel as the AM (70% travel westbound on Beacon Street and 30% travel northbound on Irvine Avenue)
- A school faculty member was observed near the crosswalks at Coral Place and Irvine Avenue to facilitate northbound pedestrian traffic across Coral Place

- Existing "NO STOPPING, 2PM-4PM, SCHOOL DAYS" signs are posted along the east side of Irvine Avenue north of Beacon Street as well as the west side of Irvine Avenue from Cliff Drive to Beacon Street.

Newport Harbor High School

Drop-off

School begins (bell rings) at 8:00 AM
Period of observation: 7:00 AM – 8:30 AM
Observations:

- Two crossing guards were posted at 7:00 AM at each of the following intersections:
    - Irvine Avenue at 15th Street
    - Irvine Avenue at 16th Street
- Heavy traffic queues were observed on 15th Street east of Irvine Avenue at 7:50 AM
- Parents were observed traveling westbound on 15th Street and stopping in the #2 travel lane on either side of St. Andrews Road, either the right turn lane west of St. Andrews or the merge lane to the east, to drop-off their children. This occurred 25-30 times. Through traffic is still able to utilize #1 westbound travel lane.
- Several eastbound-traveling vehicles were observed making illegal mid-block U-turns on 15th Street to turn around and go westbound.
- Jaywalkers were observed crossing 15th Street between St. Andrews Road and Clay Street.
    - Students park in the designated permitted student parking next to St. Andrews Church and cross the street from the parking lot entrance. The closest crosswalks (at St. Andrews Road) are located 330 feet to the west.
- At the crosswalks at 15th Street at St. Andrews Road:
    - Parents approaching this intersection stop in the travel lane on 15th Street at the crosswalk to drop off their children, often halting traffic behind them.
    - There were several observed occurrences where cars blocked the intersection.
- At the intersection of Margaret Drive at Irvine Avenue there is an existing rectangular rapid flash beacon (RRFB) at the south leg of the intersection.
    - Pedestrians were observed running across the crosswalk towards the end of the RRFB phase.
    - Most vehicles responded to the RRFB call.
    - Vehicles travel southbound on Irvine Avenue and turn onto Margaret Drive to drop students off near the intersection so they can cross with the RRFB. Vehicles either turn around and exit onto Irvine Avenue or continue through to Tustin Avenue. Some vehicles also travel eastbound on Margaret Avenue and exit onto Irvine Avenue after dropping off their children.

Pick-up

School ends (bell rings) at 3:05 PM

Period of observation: 2:30 PM – 3:30 PM

Observations:

- Based on information provided by the school, approximately 50-60% of students leave at 3:05 PM.
- 2:30 PM – Crossing guards are posted at the two locations.
- 2:55 PM – A vehicle queue began for cars in the #2 westbound lane on 15th Street east of Irvine Avenue.
- The west leg of Irvine Avenue and 15th Street has a street width of approximately 40 feet.
    - Cars are parked on both sides of the street and traffic is heavy (around 3:00 PM). The area is very congested.
    - Bicyclists were observed travelling westbound on 15th Street west of Irvine Avenue, weaving between cars in the westbound and eastbound travel lanes.
- High bicyclist and pedestrian volumes from the middle school were observed traveling northbound on Irvine Avenue; most bicyclists use the bike lane and some travel in the sidewalk.
- Number of observed jaywalkers observed along 15th Street east of Irvine Avenue: At least 20
    - There is a high volume of pedestrians leaving campus within 5 minutes of school ending.
    - Students who park in the St. Andrew's Church parking lot across the street jaywalk to get there. 15th Street east of Irvine Avenue is busy at the time school ends.
- Students jaywalk across 16th Street from the north parking lot.

Existing Traffic Volumes

Vehicular, Pedestrian, and Bicycle Turning Movement Counts

Existing morning peak/School Drop-off period (7:00 to 9:00 AM), mid-day peak/School Pick-up period (2:00 to 4:00 PM), and evening peak period (4:00 to 6:00 PM) turning movement counts were collected for the following study intersections:

1. 16th Street at Tustin Avenue
2. 16th Street at Irvine Avenue
3. Irvine Avenue at Margaret Drive
4. 15th Street at Westminster Avenue
5. 15th Street at Santa Ana Avenue
6. 15th Street at Redlands
7. 15th Street at Tustin Avenue
8. 15th Street at Irvine Avenue
9. 15th Street at St. Andrews Road
10. Clay Street at Westminster Avenue
11. Clay Street at Santa Ana Avenue
12. Clay Street at Tustin Avenue
13. Clay Street at Irvine Avenue
14. Irvine Avenue at Coral Place
15. Beacon Street at Tustin Avenue
16. Beacon Street at Irvine Avenue
17. Coast Highway at Riverside Drive
18. Cliff Drive at Riverside Avenue
19. Cliff Drive at Irvine Avenue
20. Cliff Drive at Kings Road

The existing vehicular turning movement volumes are shown on Figure 4. Existing pedestrian crossing volumes at intersections are shown on Figure 5. Existing volumes for bicycle and skateboard movements at intersections are shown in Figure 6. The counts were completed in October 2017 and March 2018. The turning movement data collection worksheets can be found in *Appendix A*.

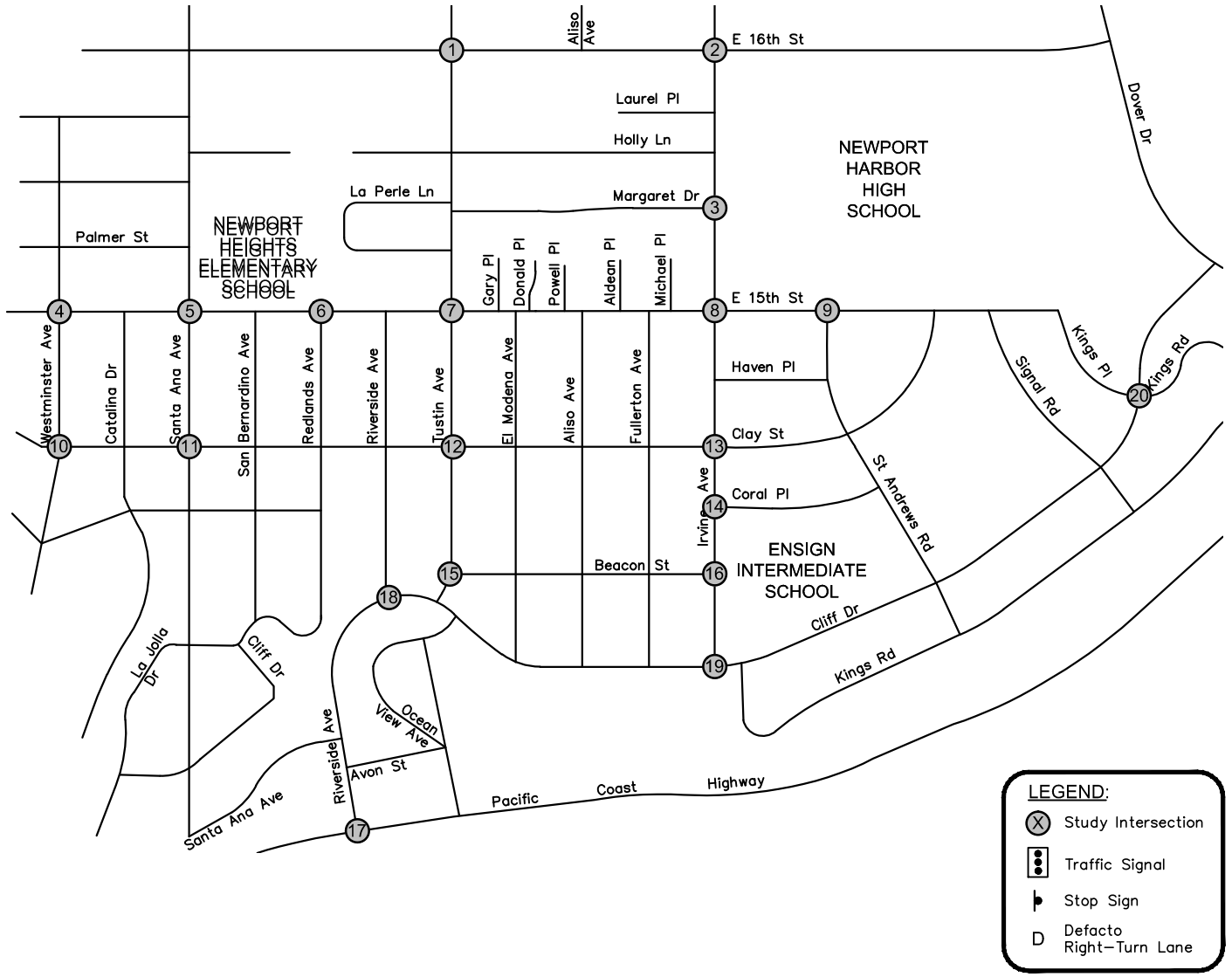
Existing midblock peak hour volumes were collected at select locations and included pedestrians, bicyclists, and skateboarders that were traveling on the sidewalk and along the side of the street. The counts were completed in January and March of 2018. Existing midblock volumes for pedestrians are shown on Figure 5. Existing midblock volumes for bicyclists and skateboarders are shown on Figure 6. The collected volumes reflect all pedestrian, bicycle, and skateboard traffic throughout the area, not just volumes relating to school traffic.

Pedestrian, Bicycle, and Skateboard Midblock Counts

Pedestrian, bicycle, and skateboard counts were also collected at midblock locations on the following roadway segments:

- 15th Street from Westminster Avenue to Santa Ana Avenue
- 15th Street from Clay Street to Kings Place
- Cliff Drive from Kings Road to Dover Drive
- Holly Lane from Tustin Avenue to Irvine Avenue
- Margaret Drive from Tustin Avenue to Irvine Avenue
- Riverside Avenue from Pacific Coast Highway to Riverside Avenue/Cliff Drive
- Santa Ana Avenue from Clay Street to 15th Street
- Santa Ana Avenue from 15th Street to 16th Street
- Tustin Avenue from 15th Street to 16th Street

NOT TO SCALE



LEGEND:
- Study Intersection
- Traffic Signal
- Stop Sign
- D Defacto Right–Turn Lane

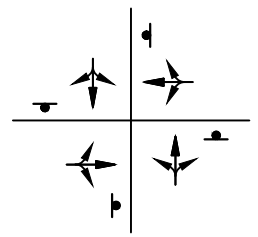
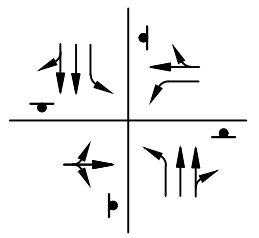
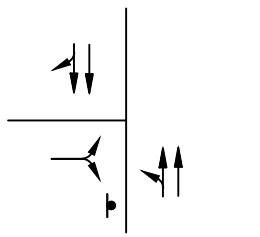
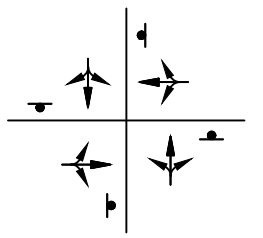
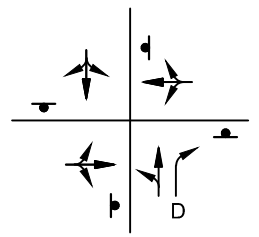
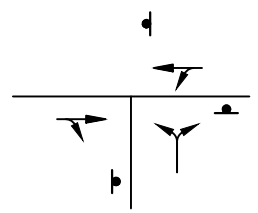
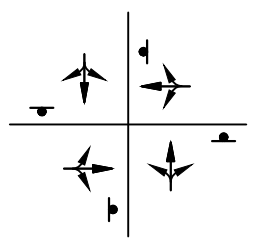
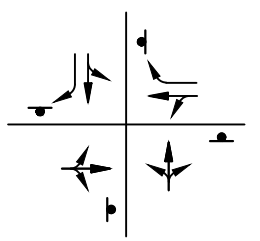
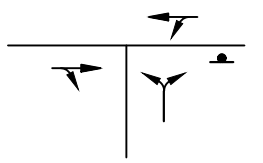
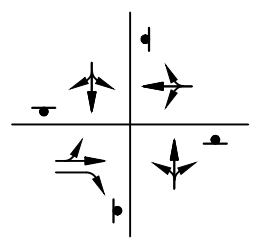
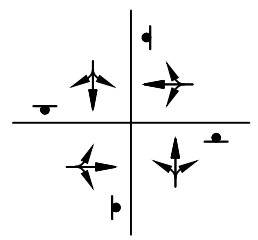
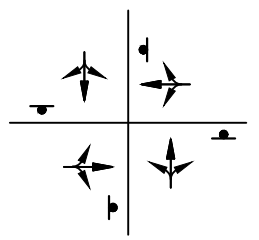
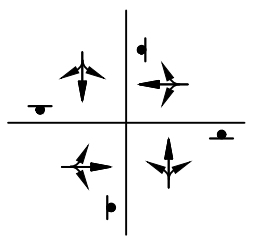
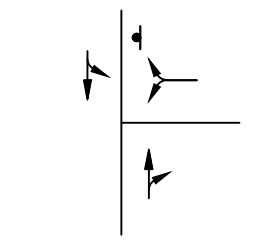
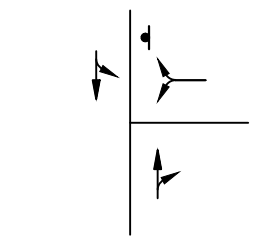
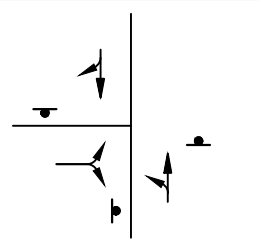
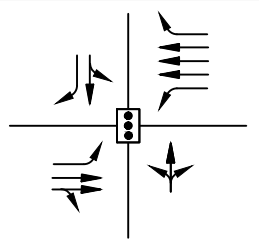
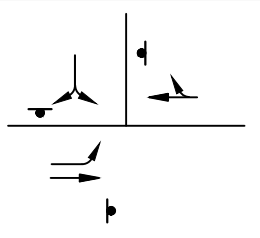
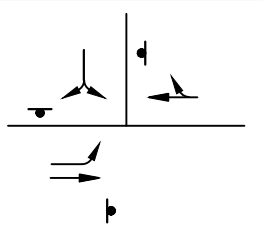
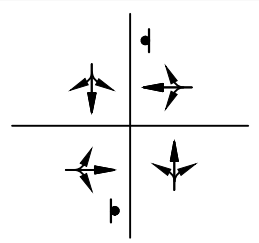
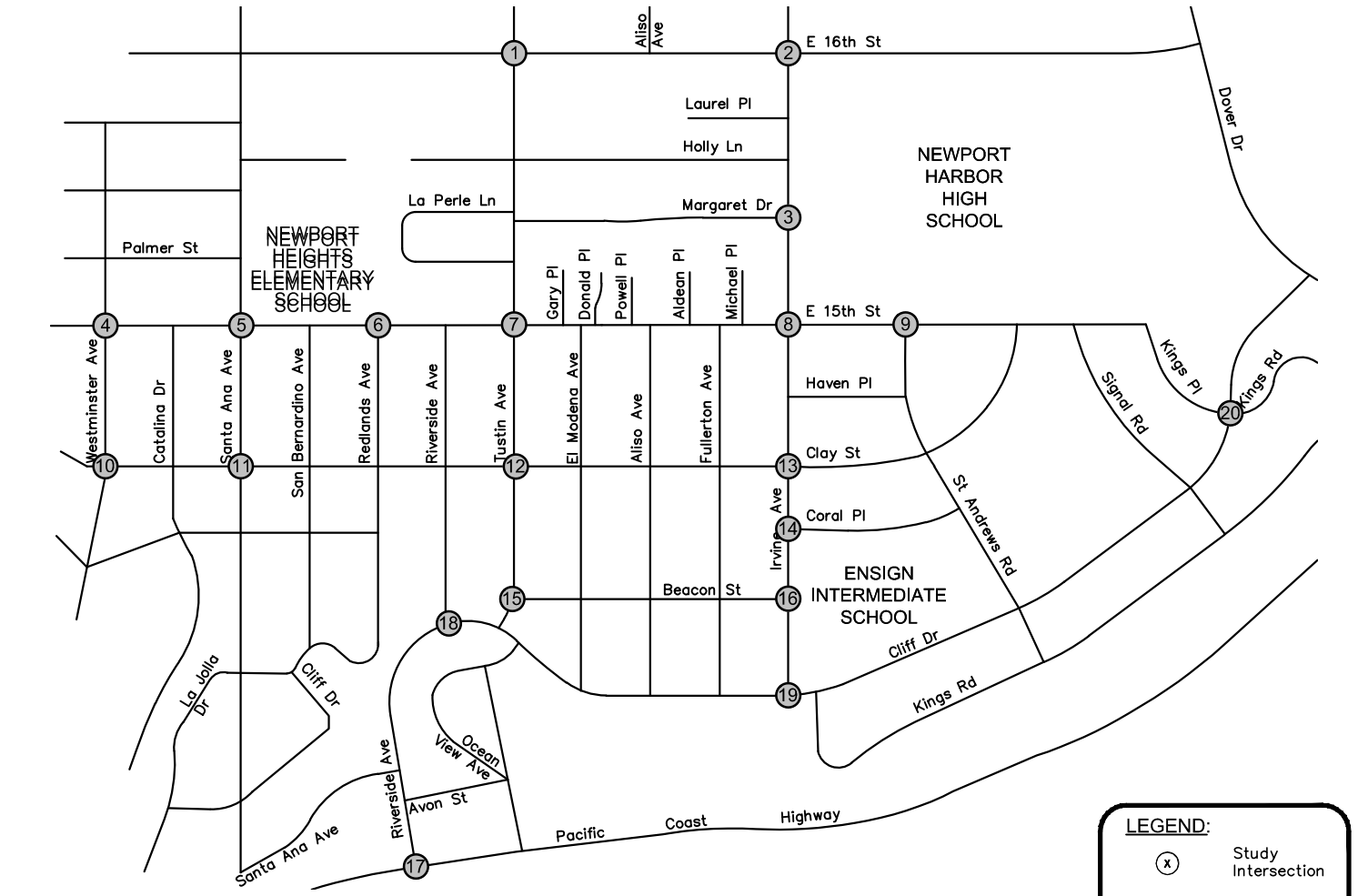
1. E 16th St at Tustin Ave	2. E 16th St at Irvine Ave	3. Irvine Ave at Margaret Dr	4. E 15th St at Westminster Ave	5. E 15th St at Santa Ana Ave
				
6. E 15th St at Redlands Ave	7. E 15th St at Tustin Ave	8. E 15th St at Irvine Ave	9. E 15th St at St Andrews Rd	10. Clay St at Westminster Ave
				
11. Clay St at Santa Ana Ave	12. Clay St at Tustin Ave	13. Clay St at Irvine Ave	14. Irvine Ave at Coral Pl	15. Tustin Ave at Beacon St
				
16. Irvine Ave at Beacon St	17. Pacific Coast Hwy at Riverside Ave	18. Cliff Dr at Riverside Ave	19. Cliff Dr at Irvine Ave	20. Cliff Dr at Kings Pl
				

FIGURE 3
EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

NOT TO SCALE



LEGEND:

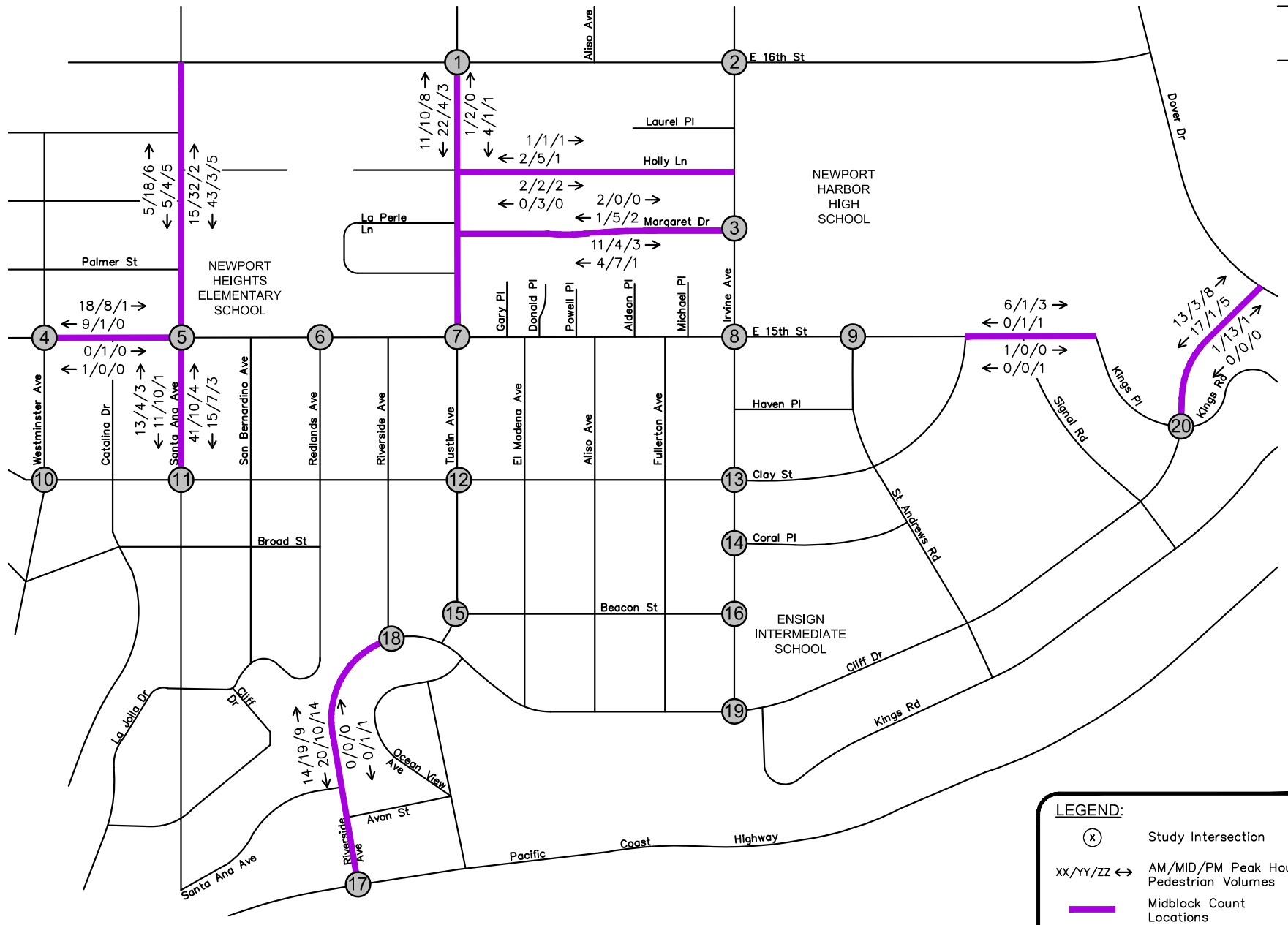
(X)	Study Intersection
XX / YY / ZZ	AM/MID/PM Peak Hour Turning Movement Volumes

COLLECTION PERIODS:
MORNING (AM): 7:00 AM – 9:00 AM
MID-DAY (MID): 2:00 PM – 4:00 PM
EVENING (PM): 4:00 PM – 6:00 PM

1. E 16th St at Tustin Ave	2. E 16th St at Irvine Ave	3. Irvine Ave at Margaret Dr	4. E 15th St at Westminster Ave
14/18/23 ↙ 202/207/171 ↓ 29/43/31 ↘	12/46/70 ↙ 372/388/461 ↓ 133/137/143 ↘	90/48/27 ↙ 345/391/600 ↓ 0/4/6 ↘	7/2/1 ↙ 22/12/4 ↓ 2/6/3 ↘
14/26/38 ← 46/108/122 ← 25/18/24 ←	92/115/159 ← 25/75/118 ← 33/56/120 ←	44/15/15 ↰	0/5/2 ← 133/126/106 ← 26/37/54 ←
15/27/18 ↱ 70/82/99 → 49/32/17 ↳	24/25/26 ↱ 72/83/57 → 17/17/28 ↳	26/9/5 ↳	2/0/2 ↱ 183/131/111 → 9/14/8 ↳
28/24/5 ↑ 284/317/152 ↑ 14/20/13 ↑	20/17/22 ↑ 417/415/332 ↑ 29/74/53 ↑	8/19/10 ↑ 407/513/370 ↑	25/35/15 ↑ 9/13/8 ↑ 30/38/53 ↑
5. E 15th St at Santa Ana Ave	**6. E 15th St at Redlands Ave**	**7. E 15th St at Tustin Ave**	**8. E 15th St at Irvine Ave**
31/42/39 ↙ 75/113/112 ↓ 39/39/50 ↘	2/2/13 ↙ 1/0/3 ↓ /1 ↘	39/55/39 ↙ 137/140/107 ↓ 67/54/39 ↘	109/106/141 ↙ 113/153/278 ↓ 140/140/144 ↘
62/88/68 ← 117/143/131 ← 17/28/27 ←	150/197/197 ← 12/16/8 ←	70/63/21 ← 107/133/146 ← 12/15/15 ←	110/177/149 ← 57/80/67 ← 13/17/20 ←
57/32/39 ↱ 151/105/131 → 22/16/12 ↳	2/2/14 ↱ 172/135/166 → 11/13/8 ↳	42/43/31 ↱ 138/108/130 → 13/10/11 ↳	97/72/59 ↱ 77/60/69 → 9/22/20 ↳
13/11/9 ↑ 91/95/82 ↑ 16/12/8 ↑	21/14/6 ↑ 0/1/2 ↑ 11/15/3 ↑	12/13/3 ↑ 150/147/111 ↑ 4/9/4 ↑	15/11/10 ↑ 203/261/168 ↑ 15/19/17 ↑
9. E 15th St at St Andrews Rd	**10. Clay St at Westminster Ave**	**11. Clay St at Santa Ana Ave**	**12. Clay St at Tustin Ave**
← 119/208/200 ← 37/13/6 ←	5/13/5 ↙ 45/48/58 ↓ 18/15/6 ↘	13/25/20 ↙ 58/77/92 ↓ 58/60/29 ↘	17/19/11 ↙ 119/119/119 ↓ 40/25/11 ↘
2/6/2 ↱ 176/167/183 → 48/39/31 ↳	17/21/8 ← 97/62/23 ← 75/64/57 ←	46/63/40 ← 163/128/61 ← 8/6/9 ←	33/48/13 ← 98/78/41 ← 5/2/3 ←
56/54/25 ↑ 29/14/7 ↑	2/2/2 ↱ 122/51/21 → 12/15/16 ↳	23/17/15 ↱ 230/107/53 → 4/6/5 ↳	23/22/21 ↱ 191/110/54 → 25/20/3 ↳
	10/3/7 ↑ 38/70/65 ↑ 130/76/46 ↑	2/4/2 ↑ 56/52/38 ↑ 10/8/5 ↑	32/27/8 ↑ 105/123/81 ↑ 1/6/6 ↑
13. Clay St at Irvine Ave	**14. Irvine Ave at Coral Pl**	**15. Tustin Ave at Beacon St**	**16. Irvine Ave at Beacon St**
14/22/22 ↙ 121/174/280 ↓ 12/10/9 ↘	137/187/209 ← 55/44/12 ←	83/105/117 ← 75/45/4 ←	33/23/11 ↙ 104/145/266 ↓ /4 ↘
15/18/11 ← 54/48/19 ← 4/1/2 ←	27/32/13 ← 3/4/5 ←	55/32/10 ← 10/11/3 ←	/1 ←
32/36/19 ↱ 93/50/25 → 59/34/12 ↳	198/150/158 ↑ 12/18/5 ↑	0/1/0 ↑ 84/103/93 ↑ 7/10/7 ↑	62/17/11 ↑ 30/15/8 ↑ 29/29/10 ↑ 139/202/161 ↑
46/22/12 ↑ 165/198/175 ↑ 4/6/6 ↑			
17. Pacific Coast Hwy at Riverside Ave	**18. Cliff Dr at Riverside Ave**	**19. Cliff Dr at Irvine Ave**	**20. Cliff Dr at Kings Pl**
288/366/514 ↙ 0/2/11 ↓ 79/97/78 ↘	91/100/83 ↙ 120/44/24 ↓	95/117/194 ↙ 49/57/44 ↓	3/2/2 ↙ 1/1/1 ↓ 11/19/18 ↘
39/66/34 ← 1075/2234/2322 ← 13/6/10 ←	59/67/46 ← 285/317/464 ← 0/1/1 ←	62/51/28 ← 192/157/134 ←	134/42/45 ← 245/208/310 ← 9/12/9 ←
232/260/251 ↱ 2110/1751/1662 → 6/23/32 ↳	47/103/87 ↱ 203/241/196 →	119/119/127 ↱ 202/105/101 →	2/1/4 ↱ 354/272/121 → 4/5/4 ↳
4/12/17 ↑ 0/11/9 ↑ 1/14/19 ↑			0/3/3 ↑ 1/4/2 ↑ 16/11/8 ↑

FIGURE 4
EXISTING VEHICULAR PEAK HOUR TRAFFIC VOLUMES

NOT TO SCALE



LEGEND:

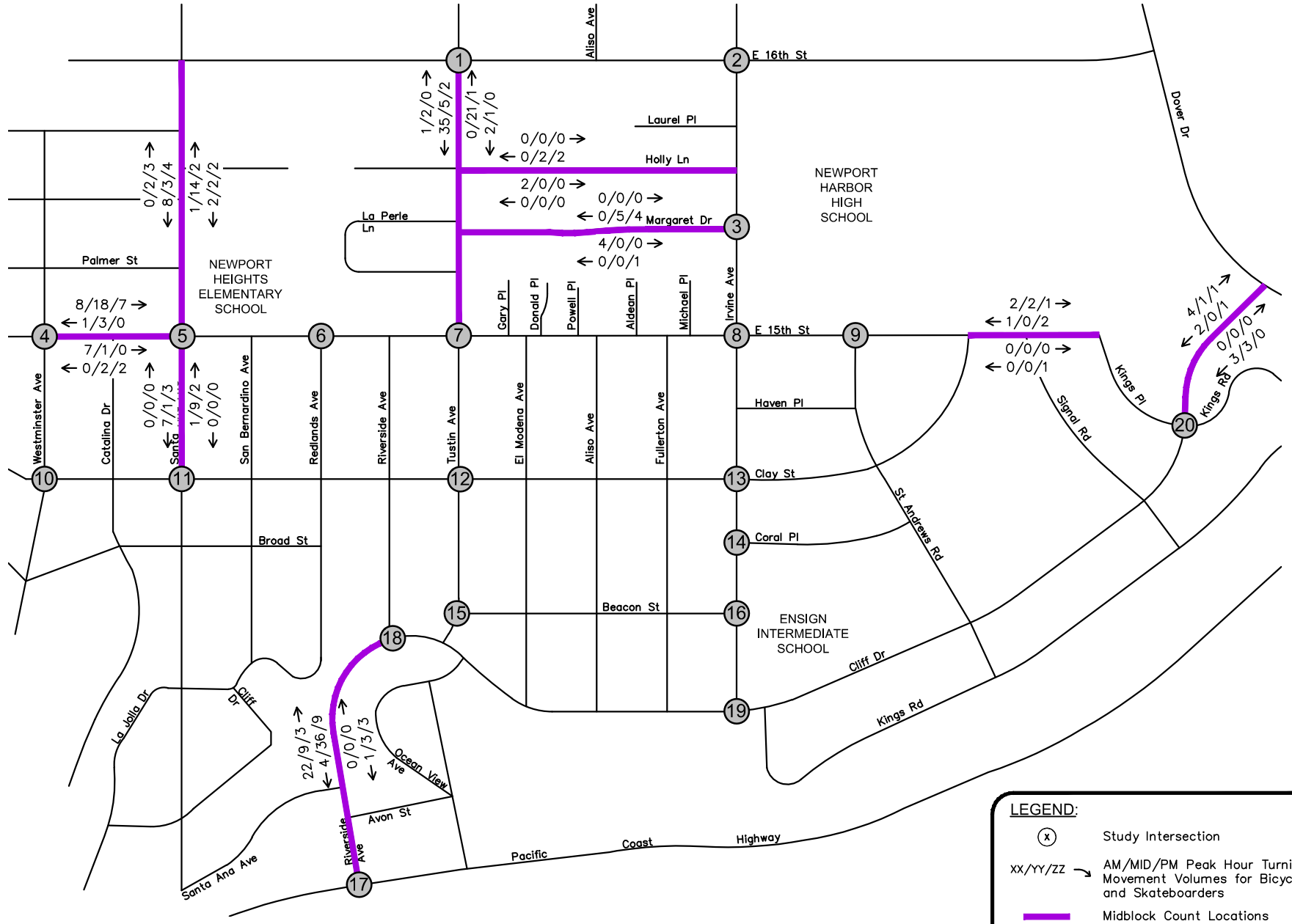
(X)	Study Intersection
XX/YY/ZZ ↔	AM/MID/PM Peak Hour Pedestrian Volumes
	Midblock Count Locations
XX/YY/ZZ →	AM/MID/PM Peak Hour Directional Midblock Pedestrian Volumes

COLLECTION PERIODS:
MORNING (AM): 7:00 AM – 9:00 AM
MID-DAY (MID): 2:00 PM – 4:00 PM
EVENING (PM): 4:00 PM – 6:00 PM

1. E 16th St at Tustin Ave	2. E 16th St at Irvine Ave	3. Irvine Ave at Margaret Dr	4. E 15th St at Westminster Ave
↕9/14/7 ↔8/9/7 ↔22/15/9 ↕13/8/3	↕46/34/8 ↔11/37/8 ↔63/46/9 ↕39/139/30	↕72/34/11 ↔1/0/0 ↔214/99/37	↕6/0/2 ↔20/33/9 ↔0/5/0 ↕3/6/0
5. E 15th St at Santa Ana Ave	**6. E 15th St at Redlands Ave**	**7. E 15th St at Tustin Ave**	**8. E 15th St at Irvine Ave**
↕11/19/7 ↔84/85/16 ↔17/27/3 ↕121/107/12	↕88/67/4 ↔98/107/12 ↔26/32/5	↕12/5/3 ↔35/54/14 ↔11/11/1 ↕0/5/1	↕38/8/6 ↔74/109/10 ↔15/2/7 ↕47/128/10
9. E 15th St at St Andrews Rd	**10. Clay St at Westminster Ave**	**11. Clay St at Santa Ana Ave**	**12. Clay St at Tustin Ave**
↕65/44/3 ↔18/39/4 ↕113/87/7	↕42/0/2 ↔10/0/0 ↔62/3/0 ↕41/6/1	↕36/8/6 ↔8/0/0 ↔58/15/1 ↕35/9/3	↕0/2/2 ↔4/5/1 ↔6/21/3 ↕4/1/2
13. Clay St at Irvine Ave	**14. Irvine Ave at Coral Pl**	**15. Tustin Ave at Beacon St**	**16. Irvine Ave at Beacon St**
↕2/2/0 ↔17/11/5 ↔18/12/3 ↕47/103/10	↔1/0/0 ↔0/2/0 ↕128/162/9	↔0/3/0 ↔2/0/2 ↕4/2/3	↕6/1/1 ↔96/122/10 ↔120/9/3 ↕27/45/11
17. Pacific Coast Hwy at Riverside Ave	**18. Cliff Dr at Riverside Ave**	**19. Cliff Dr at Irvine Ave**	**20. Cliff Dr at Kings Pl**
↕11/1/0 ↔9/17/9 ↔10/0/5 ↕15/21/6	↔13/7/9 ↕2/0/1	↔6/22/4 ↕29/39/14	↕2/2/2 ↔1/15/2 ↔20/2/13 ↕1/2/0

FIGURE 5
EXISTING PEDESTRIAN PEAK HOUR TRAFFIC VOLUMES

NOT TO SCALE



LEGEND:

- (X) Study Intersection
- XX/YY/ZZ → AM/MID/PM Peak Hour Turning Movement Volumes for Bicyclists and Skateboarders
- Midblock Count Locations
- XX/YY/ZZ → AM/MID/PM Total Peak Hour Directional Midblock Volumes for Bicyclists and Skateboarders

COLLECTION PERIODS:
MORNING (AM): 7:00 AM – 9:00 AM
MID-DAY (MID): 2:00 PM – 4:00 PM
EVENING (PM): 4:00 PM – 6:00 PM

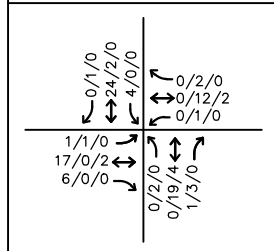
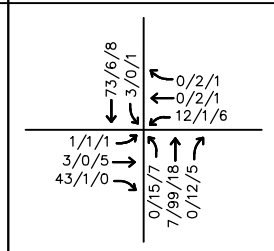
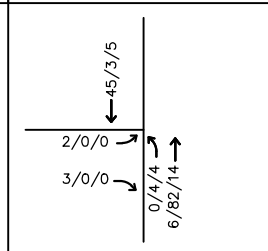
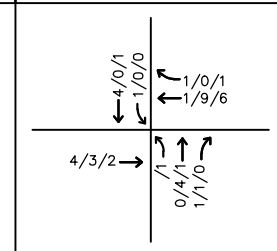
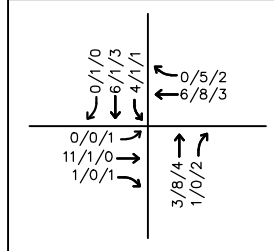
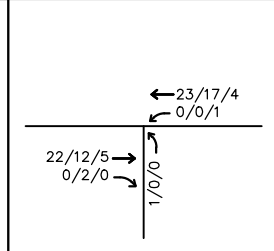
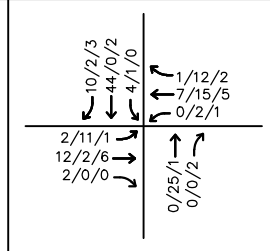
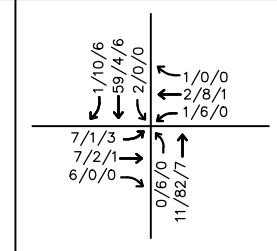
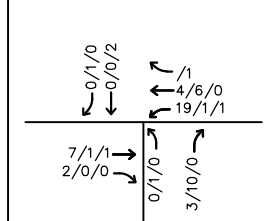
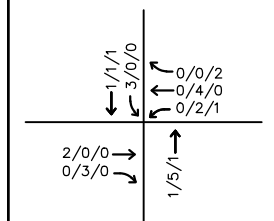
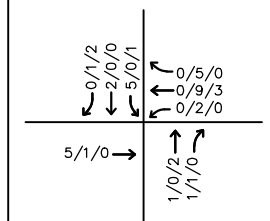
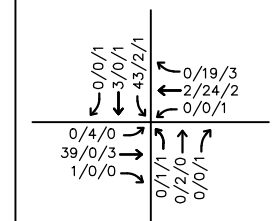
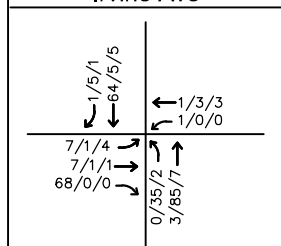
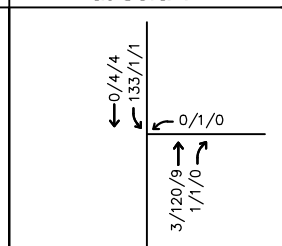
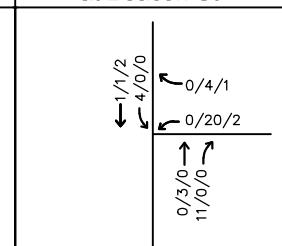
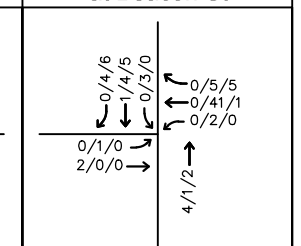
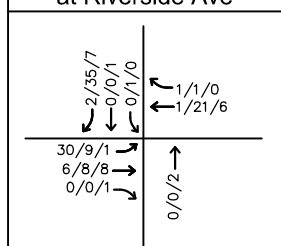
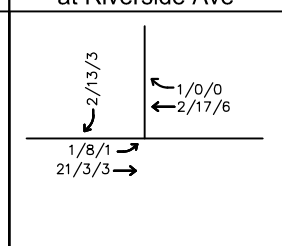
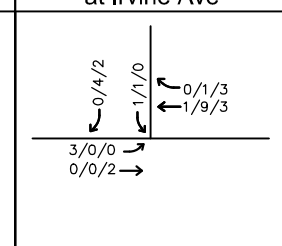
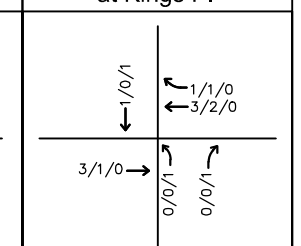
1. E 16th St at Tustin Ave	2. E 16th St at Irvine Ave	3. Irvine Ave at Margaret Dr	4. E 15th St at Westminster Ave
			
5. E 15th St at Santa Ana Ave	**6. E 15th St at Redlands Ave**	**7. E 15th St at Tustin Ave**	**8. E 15th St at Irvine Ave**
			
9. E 15th St at St Andrews Rd	**10. Clay St at Westminster Ave**	**11. Clay St at Santa Ana Ave**	**12. Clay St at Tustin Ave**
			
13. Clay St at Irvine Ave	**14. Irvine Ave at Coral Pl**	**15. Tustin Ave at Beacon St**	**16. Irvine Ave at Beacon St**
			
17. Pacific Coast Hwy at Riverside Ave	**18. Cliff Dr at Riverside Ave**	**19. Cliff Dr at Irvine Ave**	**20. Cliff Dr at Kings Pl**
			

FIGURE 6
EXISTING BICYCLE AND SKATEBOARD PEAK HOUR TRAFFIC VOLUMES

Kimley»Horn

SCHOOL SIGNAGE INVENTORY

The existing school-related signs posted along the streets bordering the perimeter of each campus were assessed. Field data collection was conducted to attain the following information:

- Location of each sign;
- Quality of each sign – whether it was damaged, faded, or graffitied;
- Compliance with the school sign standards in the California Manual on Uniform Traffic Control (CA MUTCD), Chapter 7B.

Newport Heights Elementary School

Figure 7 depicts the existing school signs at Newport Heights Elementary School as well as signs to be replaced or installed. In the Newport Heights Elementary School area, the signs in place are in compliance with MUTCD standards. One school crossing sign along Santa Ana Avenue in the northbound direction, adjacent to the school, is faded and should be replaced. An additional school crossing ahead sign is recommended for southbound traffic along Santa Ana Avenue, near 16th Street. The existing school crossing sign facing westbound traffic along 15th Street, near Redlands Avenue should be replaced with the current school warning sign type.

Ensign Intermediate School

Figure 8 presents the existing school signs at Ensign Intermediate School as well as signs to be replaced. At Ensign Intermediate School, the existing school warning signage in place along the streets approaching the school are compliant with MUTCD standards. One group of school crossing warning signs along Irvine Avenue in the southbound direction near Clay Street are slightly obstructed due to overgrown tree branches requiring trimming and maintenance. Another group of school crossing warning signs along St. Andrews Road in the southbound direction near Coral Place are faded and should be replaced.

Newport Harbor High School

Figure 9 shows the existing school signs at Newport Harbor High School as well as signs to be replaced, installed, or relocated. At Newport Harbor High School, existing school warning signs are present along the streets approaching the school (Irvine Avenue, 15th Street, and 16th Street). Several groups of signs were observed to be faded, damaged, or graffitied and are recommended to be replaced. In addition, several signs have been identified to be updated to current standards as well as additional school ahead signs and school crossing ahead signs that should be installed to further comply with Chapter 7B of the MUTCD. Lastly, one group of signs along 15th Street, east of the school parking lot, is obstructed by a tree and should be relocated to a more visible location for oncoming vehicles.

CA MUTCD = CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

FIGURE 7
SCHOOL SIGNS - NEWPORT HEIGHTS ELEMENTARY SCHOOL

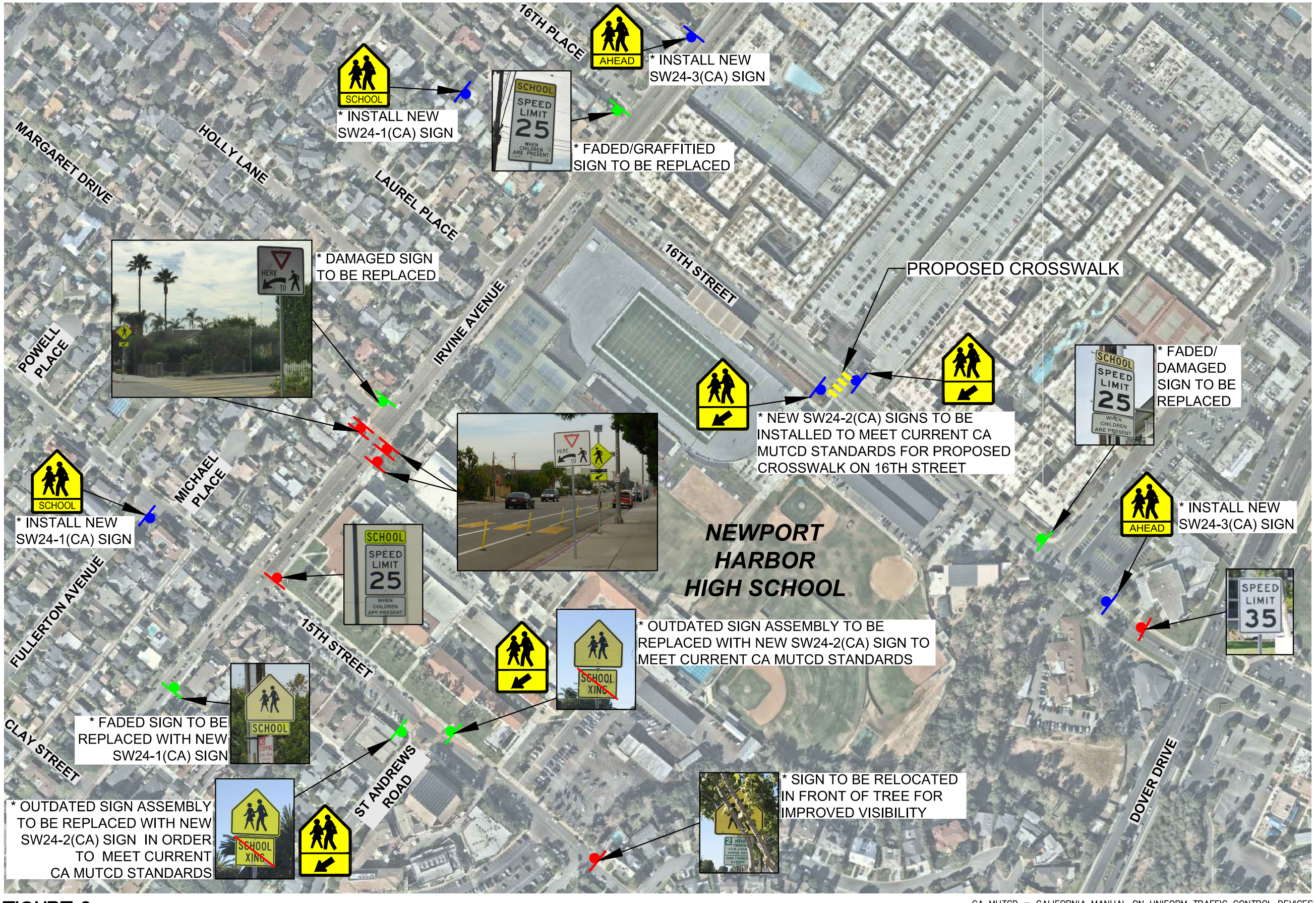
NOT TO SCALE

LEGEND:

- Existing Sign to Remain
- Existing Sign to be Udated/Replaced
- Proposed New Sign

FIGURE 8
SCHOOL SIGNS - ENSIGN INTERMEDIATE SCHOOL

Kimley»Horn



NOT TO SCALE

LEGEND:

- Existing Sign to Remain
- Existing Sign to be Udated/Replaced
- Proposed New Sign

CA MUTCD = CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

FIGURE 9
SCHOOL SIGNS - NEWPORT HARBOR HIGH SCHOOL

CROSSING GUARD LOCATIONS

During the school drop-off and pick-up periods, the City employs crossing guards in the surrounding areas of each school to facilitate safe pedestrian crossing flow. Currently, eight crossing guards are present at the following intersections:

1. Santa Ana Avenue at Palmer Street (Costa Mesa)
2. Redlands Avenue at 15th Street
3. Irvine Avenue at 16th Street (2 crossing guards)
4. Irvine Avenue at 15th Street (2 crossing guards)
5. Irvine Avenue at Beacon Street

The north-south movement on the east leg of Irvine Avenue at Coral Place has over 100 pedestrians during the afternoon school peak hour combined with bicyclist and vehicular traffic. Also, the north-south movement on the east leg of Santa Ana Avenue at 15th Street has over 100 pedestrians during the morning and afternoon school peak hours. No safety issues were observed operationally, but crossing guards may be considered at these two locations given the number of pedestrian crossings.

The existing and proposed crossing guard locations through the area are presented on Figure 10.

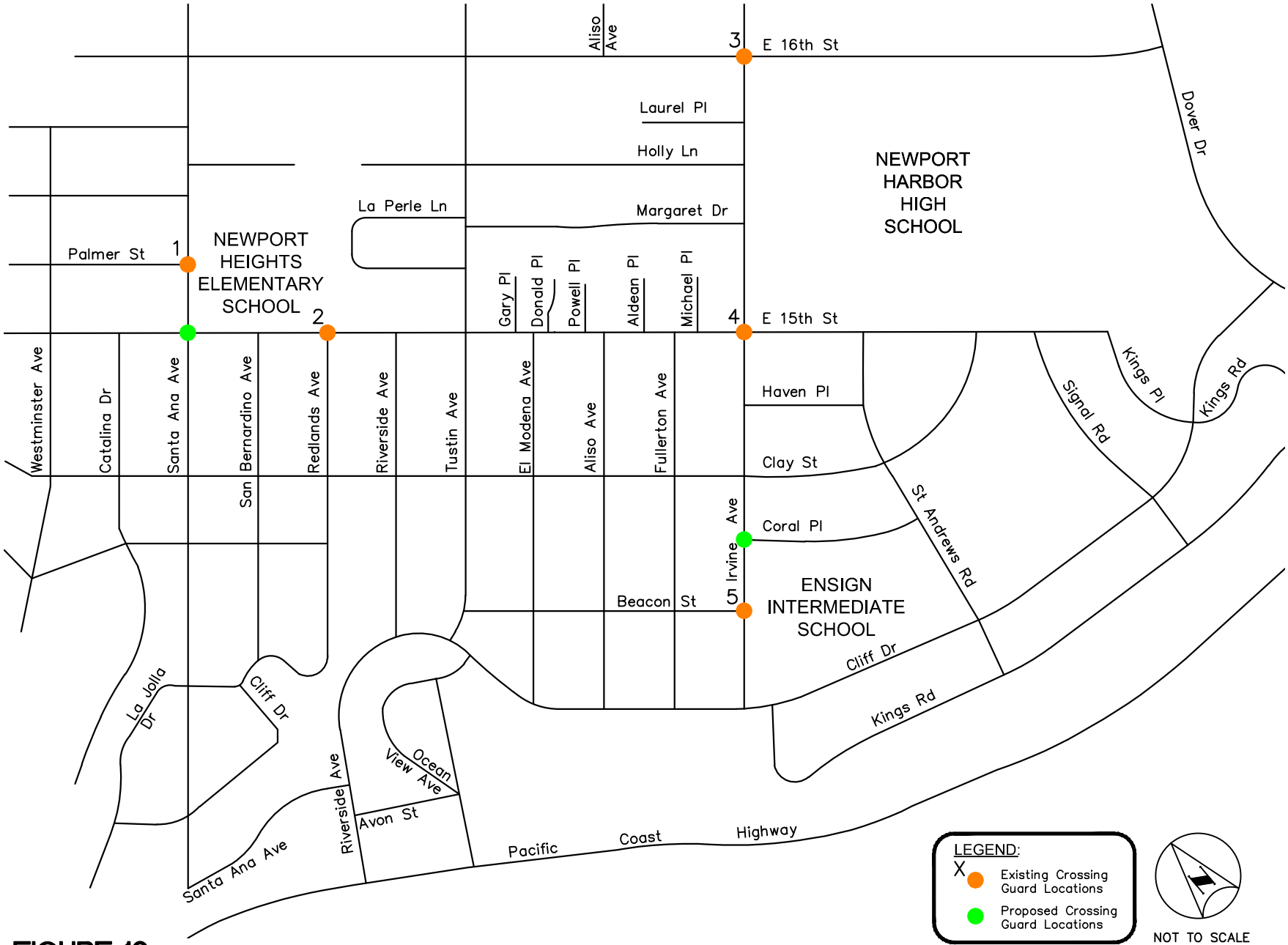


FIGURE 10
EXISTING AND PROPOSED CROSSING GUARD LOCATIONS

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PARKING ANALYSIS

Parking Count Locations

Parking count locations were determined by City of Newport Beach Staff with collaboration and input from the Newport Heights neighborhood constituents. Parking counts were collected along the following roadway segments:

Table 1 – Newport Heights Parking Count Locations

Street	Segment	
	From	To
15th Street	Westminster Avenue	Catalina Drive
	Catalina Drive	Santa Ana Avenue
	Santa Ana Avenue	San Bernardino Avenue
	San Bernardino Avenue	Redlands Avenue
	Redlands Avenue	Riverside Avenue
	Riverside Avenue	Tustin Avenue
	Tustin Avenue	El Modena Avenue
	El Modena Avenue	Aliso Avenue
	Aliso Avenue	Fullerton Avenue
	Fullerton Avenue	Irvine Avenue
	Irvine Avenue	St. Andrews Road
	St. Andrews Road	Clay Street
	Clay Street	Kings Place
Clay Street	Westminster Avenue	Catalina Drive
	Catalina Drive	Santa Ana Avenue
	Santa Ana Avenue	San Bernardino Avenue
	San Bernardino Avenue	Redlands Avenue
	Redlands Avenue	Riverside Avenue
	Riverside Avenue	Tustin Avenue
	Tustin Avenue	El Modena Avenue
	El Modena Avenue	Aliso Avenue
	Aliso Avenue	Fullerton Avenue
	Fullerton Avenue	Irvine Avenue
	Irvine Avenue	St. Andrews Road
	St. Andrews Road	Pirate Road
	Pirate Road	Snug Harbor Road
	Snug Harbor Road	15th Street

Table 1 Cont. – Newport Heights Parking Count Locations

Street	Segment	
	From	To
Irvine Avenue	16th Street	Laurel Place
	Laurel Place	Holly Lane
	Holly Lane	Margaret Drive
	Margaret Drive	15th Street
	15th Street	Haven Place
	Haven Place	Clay Street
	Clay Street	Coral Place
	Coral Place	Beacon Street
	Beacon Street	Cliff Drive
Beacon Street	Tustin Avenue	El Modena Avenue
	El Modena Avenue	Aliso Avenue
	Aliso Avenue	Fullerton Avenue
	Fullerton Avenue	Irvine Avenue
Coral Place	Irvine Avenue	St. Andrews Road
Cliff Drive	Irvine Avenue	St. Andrews Road
Holly Lane	Tustin Avenue	Irvine Avenue
Margaret Drive	Tustin Avenue	Irvine Avenue
Westminster Avenue	Broad Street	15th Street
Catalina Drive	Broad Street	15th Street
Santa Ana Avenue	Broad Street	15th Street
San Bernardino Avenue	Broad Street	15th Street
Redlands Avenue	Broad Street	15th Street
Riverside Avenue	Pacific Coast Highway	Cliff Drive
	Cliff Drive	15th Street
Tustin Avenue	Beacon Street	15th Street
El Modena Avenue	Beacon Street	15th Street
Aliso Avenue	Beacon Street	15th Street
Fullerton Avenue	Beacon Street	15th Street

Existing Parking Supply

On-street parking is generally available on both sides of the street throughout the Newport Heights area and is intended primarily to service the surrounding neighborhood. There are segments on-street, adjacent to the schools, that are designated for school student pick-up and drop-offs. There is a time restricted segment along the east side of Irvine Avenue adjacent to Newport Harbor High School between 15th Street and Margaret Drive where only 3-minute parking is allowed from 7:00 AM – 4:00 PM during the weekdays. Streets in the vicinity of Newport Harbor High School also have signage in the

neighborhood displaying permit exempt parking areas with 1-hour and 2-hour parking limits for vehicles without permits.

Parking Data Collection

To evaluate the existing parking demand on a typical weekday, parking counts were collected hourly from 7:00 AM to 6:00 PM on the following days:

- Friday, September 8, 2017
- Tuesday, September 12, 2017
- Friday, October 13, 2017
- Wednesday, January 10, 2018
- Thursday, March 29, 2018

To characterize the parking utilization along each of the segments, parking demandwas separated into the following categories with the associated color codes showing how occupied a side of the street within the study segment was parked throughout the day:

- GREEN – Street parking is not utilized or is sparsely utilized (1-3 cars) at any given time throughout the observation period
- YELLOW – Street parking is one-quarter to three-quarters utilized at any given time throughout the observation period
- ORANGE – Street parking is near capacity or fully utilized, specifically during school operating hours (8:00 AM – 3:00 PM)
- RED – Street parking is near capacity or fully utilized throughout the observation period
- GRAY – Parking is prohibited

A visual summary of the collected parking data can be seen in Figure 11.

Streets adjacent to each of the campuses (Santa Ana Avenue from 15th Street to Clay Street, 15th Street from Westminster Avenue to Tustin Avenue, 15th Street from Irvine Avenue to Clay Street, Cliff Drive from Irvine Avenue to St. Andrews Road) had a high demand for parking throughout the day. The north-south residential streets in the neighborhood had partial occupancy, between 25-75% occupied, throughout the day. Clay Street from Santa Ana Avenue to Irvine Avenue had very light parking activity throughout the day.

Existing Red Curb - 15th Street

In addition to assessing the area's on-street parking demand, information regarding location and length of existing red curb along 15th Street was also collected. The lengths of red curb adjacent to the intersections on 15th Street are summarized in Table 2.

NOT TO SCALE

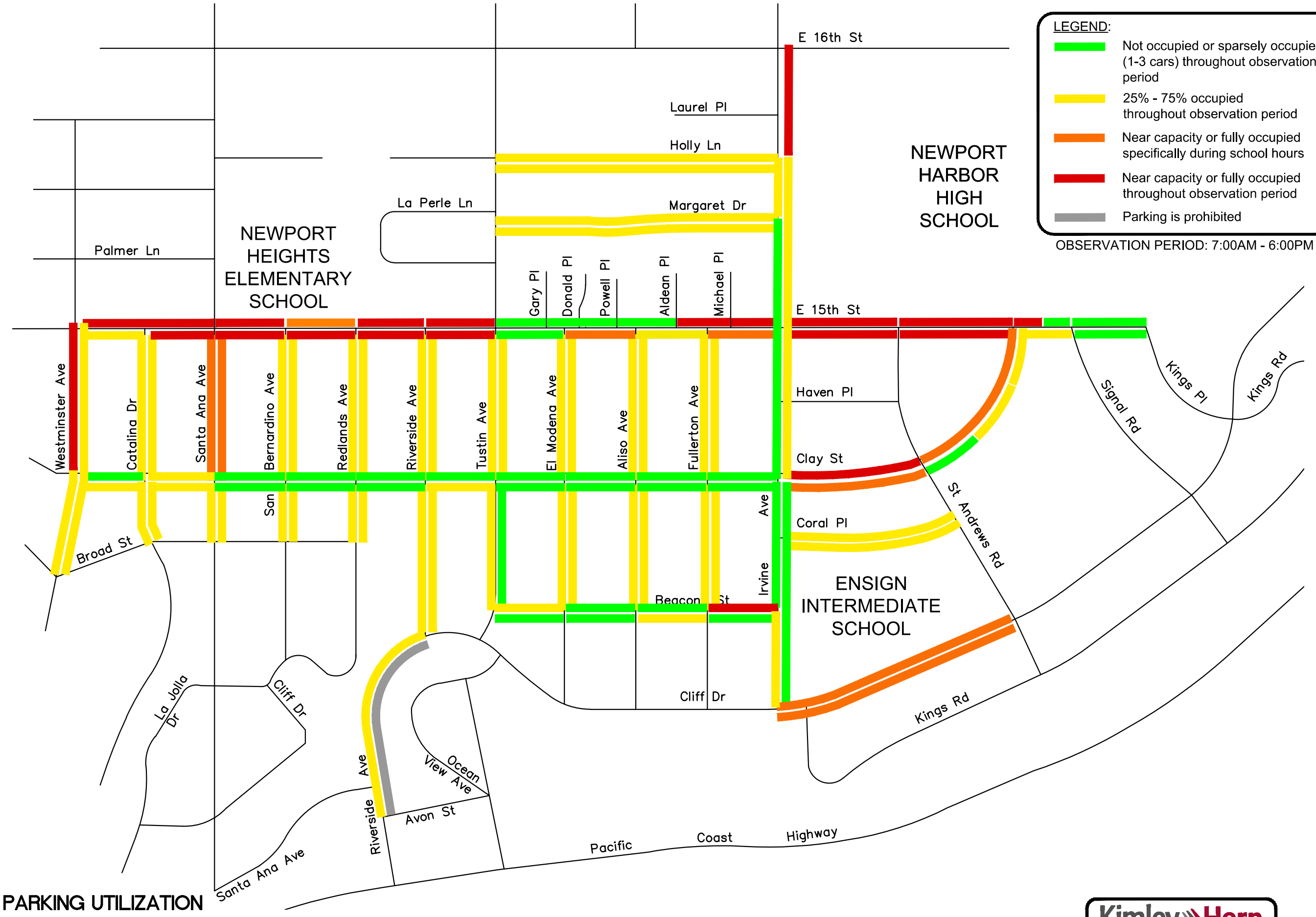


FIGURE 11
EXISTING PARKING UTILIZATION

TABLE 2
EXISTING RED CURB AT INTERSECTIONS ALONG 15TH STREET

15th Street at:	Length of Red Curb							
	WB		EB		NB		SB	
	Approach	Departure	Approach	Departure	Approach	Departure	Approach	Departure
Westminster Avenue	0'	0'	20'	20'	18'	0'	N/A	N/A
Alley between Westminster Avenue and Catalina Drive	0'	0'	0'	0'	0'	0'	N/A	0'
Catalina Drive	0'	0'	0'	21'	0'	N/A	N/A	17'
Alley between Catalina Drive and Santa Ana Avenue	0'	0'	10'	10'	N/A	N/A	N/A	N/A
Santa Ana Avenue	20'	20'	16'	20'	20'	41'	20'	23'
Alley between Santa Ana Avenue and San Bernardino Avenue	N/A	N/A	10'	10'	N/A	N/A	N/A	N/A
San Bernardino Avenue (Across from School DWY)	16'	14'	20'	22'	0'	N/A	N/A	17'
Alley between San Bernardino Avenue and Redlands Avenue	N/A	N/A	11'	6'	N/A	N/A	N/A	N/A
Redlands Avenue (Across from School DWY)	10'	31'	26'	20'	20'	N/A	N/A	17'
Alley between Redlands Avenue and Riverside Avenue	0'	0'	10'	10'	N/A	N/A	N/A	N/A
Riverside Avenue	16' (DWY)	0'	20'	20'	0'	N/A	N/A	17'
Alley between Riverside Avenue and Tustin Avenue	0'	0'	10'	10'	N/A	N/A	N/A	N/A
Tustin Avenue	7'	20'	20'	20'	0'	4'	0'	19'
Alley between Tustin Avenue and El Modena Avenue	0'	0'	10'	10'	N/A	N/A	N/A	N/A
El Modena Avenue	N/A	N/A	20'	20'	0'	N/A	N/A	18'
Alley between El Modena Avenue and Aliso Avenue	N/A	N/A	10'	10'	N/A	N/A	N/A	N/A
Aliso Avenue	22' (DWY)	0'	23'	20'	26'	N/A	N/A	17'
Alley between Aliso Avenue and Fullerton Avenue	N/A	N/A	20'	15'	N/A	N/A	N/A	N/A
Fullerton Avenue	N/A	N/A	19'	20'	0'	N/A	N/A	18'
Alley between Fullerton Avenue and Irvine Avenue	N/A	N/A	19'	38'	N/A	N/A	N/A	N/A
Irvine Avenue	28'	17' DWY 6.5' R.C.	25'	35'	123'	38'	22'	18'
Michael Place	20.5'	26'	N/A	N/A	N/A	0'	0'	N/A
Aldean Place	26.5'	24'	N/A	N/A	N/A	0'	0'	N/A
Powell Place	20'	20'	N/A	N/A	N/A	0'	0'	N/A
Donald Place	0'	0'	N/A	N/A	N/A	0'	0'	N/A
Gary Place	20'	0'	N/A	N/A	N/A	0'	0'	N/A

DWY = Driveway
RC = Red Curb
N/A = Not applicable; i.e. the approach or departure for the stated direction of movement does not exist at the resepctive intersection

SPEED DATA COLLECTION

Speed Data Survey Locations

Radar speed data was collected in September 2017, January 2018 and March 2018 during the off-peak times of the day at the following roadway segments in the neighborhood:

- Irvine Avenue
    - Between Beacon Street and Clay Street
    - Between Clay Street and 15th Street
    - Between Margaret Drive and 16th Street
- Riverside Avenue – Between Pacific Coast Highway to Cliff Drive
- Tustin Avenue – 15th Street to 16th Street (Costa Mesa)
- St. Andrews Road – Between Cliff Drive and Clay Street
- Kings Place – Between Clay Street and Kings Place
- 15th Street
    - Between Santa Ana Avenue and Tustin Avenue (North side of 15th Street between Tustin Avenue and Redlands Avenue within City of Costa Mesa boundary)
    - Between Tustin Avenue and Irvine Avenue
    - Between Irvine Avenue and St. Andrews Road
    - Between St. Andrews Road to Clay Street
    - Between Clay Street and Kings Place
- Clay Street
    - Between Irvine Avenue and Aliso Avenue
    - Between Aliso Avenue and Tustin Avenue
    - Between Redlands Avenue and Santa Ana Avenue
- Cliff Drive
    - Between Riverside Avenue and El Modena Avenue
    - Between El Modena Avenue and Irvine Avenue
    - Between Irvine Avenue and St. Andrews Road
    - Between St. Andrews Road and Signal Road
    - Between Kings Place and Dover Drive
- Holly Lane – Between Tustin Avenue and Irvine Avenue
- Margaret Drive – Between Tustin Avenue and Irvine Avenue

Statistical Analysis Factors

Significant factors used to analyze the collected survey data are summarized below:

1. 85th Percentile Speed. The critical speed, or 85th Percentile Speed, is defined as that speed at or below which 85 percent of the traffic is moving. This factor is the primary guide in determining what speeds the majority of safe and reasonable drivers are traveling. Therefore, State law requires cities to set the speed limit to the nearest 5 mph increment from the Critical Speed unless other factors require a lower limit. Speed limits set on this basis provide law enforcement officials with a means of controlling reckless or unreliable drivers who will not conform to what the majority finds reasonable.

2. 50th Percentile Speed. The Median Speed, or 50th Percentile Speed, represents the mid-point value within the range of recorded speeds for a particular roadway location. In other words, 50 percent of the vehicles travel faster than and 50 percent travel slower than, the median speed. This value is another measure of the central tendency of the vehicle speed distribution. Typically speed limits should not be set below the 50th Percentile Speed, since it would result in greater than 50-percent of the drivers exceeding the speed limit.

85th Percentile Speed Data

The 85th percentile speed data, as mentioned previously, after rounding to the nearest 5 mph is generally used to set the speed limit for a segment. The Newport Heights area has a 25 mph speed limit through the residential areas. Some sections of Irvine Avenue, Cliff Drive, and Riverside Avenue have posted speed limits of 30 mph. A summary of the speed data for each roadway segment is compiled on Table 3.

The speeds collected at the study segments are generally reasonable and demonstrate typical moderate speeds for the area. A few segments within the study area have higher measured speeds. Irvine Avenue between Margaret Drive and 16th Street is posted 30 mph with the 85th percentile at 33 mph. The segment of Tustin Avenue between 15th Street and 16th Street does not have a posted speed limit, but is assumed to be 25 mph, and has an 85th percentile speed at 35 mph.

TABLE 3
SPEED DATA SUMMARY

No. of Location	Location Name	Segment Start	Segment End	Date	Direction	50th	85th	Length (ft)	Length (mi)	Existing Posted (mph)
1	Irvine Avenue	Beacon Street	Clay Street	10/11/2017	Northbound/Southbound	26	29	650	0.12	25
2	Irvine Avenue	Clay Street	15th Street	10/11/2017	Northbound/Southbound	27	30	669	0.13	25
3	Irvine Avenue	Margaret Drive	16th Street	10/11/2017	Northbound/Southbound	29	33	792	0.15	30
4	15th Street	Santa Ana Avenue	Tustin Avenue	10/11/2017	Eastbound/Westbound	26	30	1,321	0.25	-
5	15th Street	Tustin Avenue	Irvine Avenue	10/11/2017	Eastbound/Westbound	27	31	1,319	0.25	-
6	15th Street	Irvine Avenue	St. Andrews Road	10/11/2017	Eastbound/Westbound	24	28	576	0.11	-
7	15th Street	St. Andrews Road	Clay Street	1/10/2018	Eastbound/Westbound	26	30	500	0.09	-
8	15th Street	Clay Street	Kings Road	3/29/2018	Eastbound/Westbound	21	26	617	0.12	-
9	Clay Street	Santa Ana Avenue	Redlands Avenue	10/12/2017	Eastbound/Westbound	26	29	667	0.13	-
10	Clay Street	Tustin Avenue	Aliso Avenue	10/12/2017	Eastbound/Westbound	25	27	656	0.12	-
11	Clay Street	Aliso Avenue	Irvine Avenue	10/12/2017	Eastbound/Westbound	24	27	669	0.13	-
12	Cliff Drive	Riverside Avenue	El Modena Avenue	1/10/2018	Eastbound/Westbound	30	35	750	0.14	30
13	Cliff Drive	El Modena Avenue	Irvine Avenue	10/12/2017	Eastbound/Westbound	32	35	1,002	0.19	30
14	Cliff Drive	Irvine Avenue	St. Andrews Road	10/12/2017	Eastbound/Westbound	30	35	1,200	0.23	30
15	Cliff Drive	St. Andrews Road	Signal Road	1/10/2018	Eastbound/Westbound	30	34	1,000	0.19	30
16	Cliff Drive	Kings Road	Dover Drive	3/29/2018	Eastbound/Westbound	30	34	737	0.14	-
17*	Tustin Avenue	15th Street	16th Street	1/10/2018	Northbound/Southbound	29	35	1,320	0.25	-
18	St. Andrews Road	Cliff Drive	Clay Street	1/10/2018	Northbound/Southbound	26	31	870	0.16	-
19	Kings Place	Cliff Drive	15th Street	1/10/2018	Northbound/Southbound	23	27	635	0.12	-
20	Holly Lane	Tustin Avenue	Irvine Avenue	3/29/2018	Eastbound/Westbound	21	25	1,298	0.25	-
21	Margaret Drive	Tustin Avenue	Irvine Avenue	3/29/2018	Eastbound/Westbound	21	26	1,304	0.25	-
21	Riverside Avenue	Pacific Coast Highway	Cliff Drive	3/29/2018	Northbound/Southbound	32	35	956	0.18	30

* Tustin Avenue from 15th Street to 16th Street is in the City of Costa Mesa

SIGHT DISTANCE ANALYSIS

A sight distance field review was performed for the side streets and alleys along 15th Street between Santa Ana Avenue and Irvine Avenue to evaluate the visibility for vehicle movements turning from the side streets and alleys onto 15th Street. The existing intersection control are stop signs along the minor approaches and alleys and mostly uncontrolled along 15th Street. All-way stops are located at the following intersections along 15th Street: Redlands Avenue, Tustin Avenue, Aliso Avenue, Irvine Avenue, Signal Road, and Kings Place.

A total of 17 intersections were analyzed for sight distance, the locations of which can be seen on Figure 12 . This figure also illustrates the existing red curb on 15th Street, which was previously discussed in the Parking Analysis section of this report.

The sight distance standards used in this analysis, Cases B1 and Case B2, are from the 2011 American Association of State Highway and Transportation Officials (AASHTO) – Geometric Design of Highways and Streets, Chapter 9 – Intersections (Intersection Sight Distance). Case B1 is used for left turns from a stopped position on a minor street. Case B2 is used for right turns from a stopped position on a minor street. Although the posted speed limit of 15th Street between Santa Ana Avenue and Irvine Avenue is 25 miles per hour, a conservative design speed of 30 miles per hour was used for this analysis. Table 4 shows the sight distance requirement for each case with a passenger car as the design vehicle evaluated for a 30 mph arterial. For Case B1, the minimum required sight distance is 335 feet. For Case B2, the minimum required sight distance is 290 feet. Cases B1 and B2 were evaluated at each intersection.

Table **4** – Sight Distance Requirements

Case	Passenger Car
	30 mph
B1	335 feet
B2	290 feet

2011 American Association of State Highway and Transportation Officials (AASHTO) – Geometric Design of Highways and Streets, Chapter 9 – Intersections (Intersection Sight Distance)

AASHTO designates a setback criteria of 15 feet from the edge of major road traveled way. The position set by this distance, known as the decision point, represents the typical position of the driver's eye while stopped on the minor road. The edge of traveled way, as defined by the Federal Highway Administration (FHWA), is the portion of roadway that carries vehicular movement and is exclusive of shoulders, berms, sidewalks and parking lanes. It should be noted that the Caltrans Highway Design Manual (HDM, 2016) also designates the minimum setback distance for a driver on a minor road as 15 feet from edge of traveled way (Section 405.1(2)(a) – Corner Sight Distance).

The 15 feet setback distance from edge of traveled way is used to evaluate the available sight distance along 15th Street. Parking is allowed on both sides of 15th Street. Since a typical parking lane has a width of 7 feet, the decision point used for this sight distance analysis is 8 feet behind curb. The sight distance review included fixed objects such as fences, walls, large trees (20 inches to 29 inches in diameter), structures and existing terrain.

The design features of local urban streets are governed by practical limitations to a great extent. Along 15th Street, approach sight distance is greatly restricted by older, existing residential structures on corner lots. In addition, walls or fences that are legally constructed within the side-yard setbacks on 15th Street can also control the approach and departure sight distance. Some properties along 15th Street have mature, private landscaping that has existed for decades. Also, the functional and legitimate parking requirements of the Newport Heights community should be considered.

A summary of the results can be found in Table 5. From review of Table 5, a vehicle stopped 15 feet behind the edge of traveled way on most of the side streets or alley approaches have adequate sight distance, with the exception of the alley between Fullerton Avenue and Irvine Avenue looking west. For this location, the driver's line of sight is blocked by an electrical structure located on the south side behind the back of sidewalk.

Figure 13 illustrates an example of adequate sight distance from one of the side streets, San Bernardino Avenue. Figure 14 illustrates an example of adequate sight distance from one of the alleys, between Redlands Avenue and Riverside Avenue. Figure 15 illustrates the available sight distance at the alley between Fullerton Avenue and Irvine Avenue.

TABLE 5
SIGHT DISTANCE ANALYSIS SUMMARY
AT INTERSECTIONS ALONG 15TH STREET

	Minor Approach	Sight Distance Requirement Met*?			
		Looking West	If not met, why?	Looking East	If not met, why?
1	Alleyway between Santa Ana Avenue and San Bernardino Avenue	Yes	-	Yes	-
2	San Bernardino Avenue	Yes	-	Yes	-
3	Alleyway between San Bernardino Avenue and Redlands Avenue	Yes	-	Yes	-
4	Alleyway between Redlands Avenue and Riverside Avenue	Yes	-	Yes	-
5	Riverside Avenue	Yes	-	Yes	-
6	Alleyway between Riverside Avenue and Tustin Avenue	Yes	-	Yes	-
7	Alleyway between Tustin Avenue and El Modena Avenue	Yes	-	Yes	-
8	El Modena Avenue	Yes	-	Yes	-
9	Alleyway between El Modena Avenue and Aliso Avenue	Yes	-	Yes	-
10	Alleyway between Aliso Avenue and Fullerton Avenue	Yes	-	Yes	-
11	Fullerton Avenue	Yes	-	Yes	-
12	Alleyway between Fullerton Avenue and Irvine Avenue	No	Electrical structure, tree	Yes	-
13	Michael Place	Yes	-	Yes	-
14	Aldean Place	Yes	-	Yes	-
15	Powell Place	Yes	-	Yes	-
16	Donald Place	Yes	-	Yes	-
17	Gary Place	Yes	-	Yes	-

*The driver is positioned 15 feet behind traveled way, which is 8 feet behind curb.

LIST OF MINOR APPROACHES:

1. Alley between Santa Ana Avenue and San Bernardino Avenue
2. San Bernardino Avenue
3. Alley between San Bernardino Avenue and Redlands Avenue
4. Alley between Redlands Avenue and Riverside Avenue
5. Riverside Avenue
6. Alley between Riverside Avenue and Tustin Avenue
7. Alley between Tustin Avenue and El Modena Avenue
8. El Modena Avenue
9. Alley between El Modena Avenue and Aliso Avenue
10. Alley between Aliso Avenue and Fullerton Avenue
11. Fullerton Avenue
12. Alley between Fullerton Avenue and Irvine Avenue
13. Michael Place
14. Aldean Place
15. Powell Place
16. Donald Place
17. Gary Place

NOT TO SCALE

LEGEND:
- Sight Distance Study Intersection
- Existing Red Curb
- Existing Driveway
- Available On-Street Parking

FIGURE 12
SIGHT DISTANCE ANALYSIS - STUDY INTERSECTIONS

LOOKING WEST
15' BEHIND EDGE OF TRAVELED WAY

LOOKING EAST
15' BEHIND EDGE OF TRAVELED WAY

NOTE:
CASE B1 SIGHT DISTANCES/LINES SHOWN. FOR CASE B2 SIGHT DISTANCES/LINES, DRIVER IS POSITIONED FOR A RIGHT TURN (10' TO THE RIGHT) FROM CASE B1 DRIVER POSITION.

LEGEND:
= DRIVER'S EYE POSITION
= SIGHT LINE

SCALE: 1" = 50'

GRAPHIC SCALE IN FEET
0 25 50 100

FIGURE 13 | INTERSECTION SIGHT DISTANCE
SAN BERNARDINO AVENUE AT 15TH STREET

LOOKING WEST
15' BEHIND EDGE OF TRAVELED WAY

LOOKING EAST
15' BEHIND EDGE OF TRAVELED WAY

NOTE:
CASE B1 SIGHT DISTANCES/LINES SHOWN. FOR CASE B2 SIGHT DISTANCES/LINES, DRIVER IS POSITIONED FOR A RIGHT TURN (10' TO THE RIGHT) FROM CASE B1 DRIVER POSITION.

LEGEND:
= DRIVER'S EYE POSITION
= SIGHT LINE

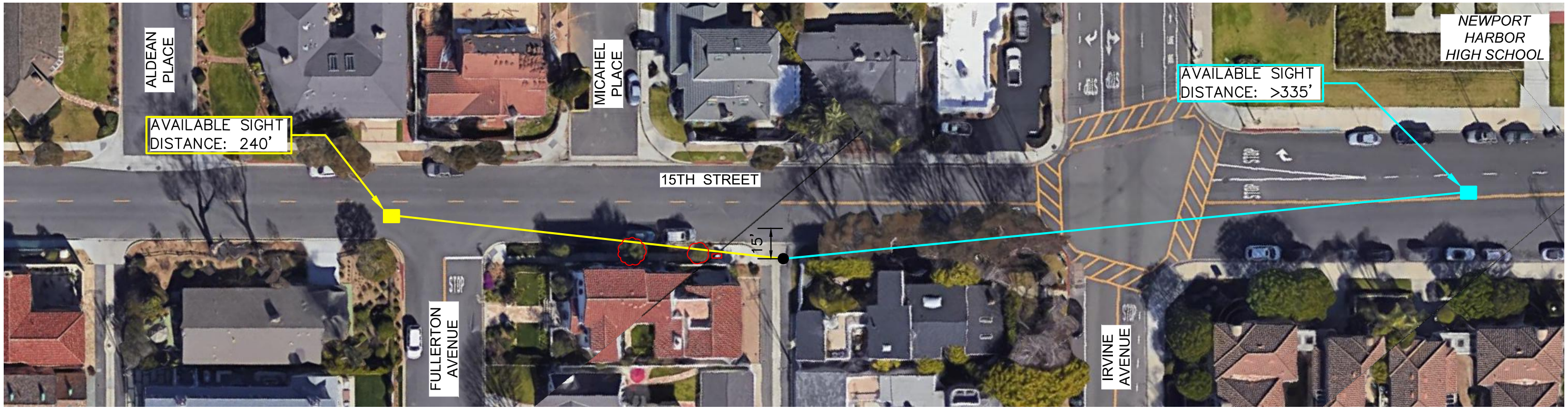
SCALE: 1" = 50'

GRAPHIC SCALE IN FEET
0 25 50 100

FIGURE 14 | INTERSECTION SIGHT DISTANCE
ALLEY BETWEEN REDLANDS AVENUE AND RIVERSIDE AVENUE AT 15TH STREET

LOOKING WEST
15' BEHIND EDGE OF TRAVELED WAY

LOOKING EAST
15' BEHIND EDGE OF TRAVELED WAY



NOTE:
CASE B1 SIGHT DISTANCES/LINES SHOWN. FOR CASE B2 SIGHT DISTANCES/LINES, DRIVER IS POSITIONED FOR A RIGHT TURN (10' TO THE RIGHT) FROM CASE B1 DRIVER POSITION.

LEGEND:
= DRIVER'S EYE POSITION
= SIGHT LINE
= TREE
= ELECTRICAL STRUCTURE

SCALE: 1" = 50'

GRAPHIC SCALE IN FEET
0 25 50 100

FIGURE 15 | INTERSECTION SIGHT DISTANCE
ALLEY BETWEEN FULLERTON AVENUE AND IRVINE AVENUE AT 15TH STREET

Kimley»Horn

RECOMMENDED MEASURES

The following recommended measures are based on the field observations conducted during school drop-off and pick-up hours and the parking, vehicular, pedestrian, bicycle, skateboard, speed and signage data collected. The list was compiled with input from City of Newport Beach Staff and presented to the constituents at a neighborhood public meeting that took place on March 14, 2018.

Newport Heights Elementary

- Add a crossing guard at the Santa Ana Avenue and 15th Street intersection.
- The school website designates the north side of 15th Street between the school parking lot and San Bernardino Avenue as a "No Student Drop-off or Pick-up" zone. Establish and post signs for pick-up and drop-off on the north side of 15th Street from Redlands Avenue to the school driveway.
- Install "No Pedestrian Crossing" signs along 15th Street on the raised median near the school driveway, and on the sidewalk between San Bernardino Avenue and Redlands Avenue. Install "Use Crosswalk" signs with an arrow pointing to the nearest crosswalk.
- Consider adding a marked crosswalk across 15th Street at San Bernardino Avenue.
- Consider designating the east side of Santa Ana Avenue between Palmer Street and Knox Street as an alternate Drop-off / Pick-up area.
- The city has discussed with NMUSD plans to re-construct the parking lot to improve circulation and pick-up and drop-off in lot.
- Install a new Stop sign at Broad Street at Catalina Drive to create a 4-way stop control at this intersection.

Ensign Intermediate School

- Designate a drop-off / pick-up area along the north side of Cliff Drive adjacent to the school.
- Add a crossing guard at the Irvine Avenue and Coral Place intersection.
- Post signs for pick-up and drop-off on Coral Place.
- Relocate the bike rack gate from the corner of Irvine Avenue and Coral Place to enter from/exit onto Coral place. Construct sidewalk from new gate location to the intersection corner.
- Change parking time restrictions on northbound Irvine Avenue to incorporate Wednesday early day release.
- Post "No Stopping, 7AM-9AM and 2PM-4PM" on Beacon Street between Irvine Avenue and Fullerton Avenue.

Newport Harbor High School

- Post "No Stopping" signs on north side of 15th Street east of Irvine Avenue to eliminate blocking of the right turn lane.
- Place time restrictions on a few angled parking spaces on the south side of 15th Street next to the St. Andrews Church parking lot and west of St. Andrews Road.
- Continue to work with NMUSD on reconstruction of the 15th Street parking lot.
- Add pedestrian warning signs along 15th Street between Clay Street and St. Andrews Road.

- Add pedestrian signage within curb extension hardscape for more visibility at the St. Andrews Road crosswalk.
- Stripe new crosswalk and install pedestrian crossing signs on 16th Street adjacent to school parking lot.

Pedestrians

- On Tustin Avenue between 15th Street and 16th Street, add signage encouraging pedestrians to use sidewalk on the west side of the street. This section of Tustin Avenue is within the City of Costa Mesa and ultimately would require their approval before posting any signage.

Signage

- Replace faded, damaged, or graffitied signs.
- Upgrade existing legally conforming school signs in the area to fluorescent yellow-green.
- Add School-related advance warning signage consistent with the CA MUTCD, Section 7B.
- Add Stop Ahead and pedestrian crossing ahead warning signs for southbound Irvine Avenue north of 16th Street.
- Add R81 "Bike Lane" signs where required.

General

- Newport Beach Public Works will work with NMUSD, each school individually, and the Police Department to prepare "Suggested Route to School" plans. Once complete, it will be distribute to parents and students and posted on social media.
- Continue working with NMUSD and with schools to incorporate education programs in the classroom or at scheduled assemblies.
- Update existing yellow school crosswalks to new, high-visibility "Continental" crosswalk striping, consistent with new yellow crosswalk installations.
- Based on the measured bicycle volumes on Clay Street, together with the low parking counts, it is recommended that parking be limited on Clay Street between Santa Ana Avenue and Irvine Avenue by incorporating the following changes:
    - Stripe bike lanes on both sides of Clay Street
    - Post 'No Stopping' signs on south side from 7:00 AM – 9:00 AM
    - Post 'No Stopping' signs on north side from 2:00 PM – 4:00 PM
    - These postings will be consistent with restrictions on Irvine Avenue
    - Implementing bike lanes meets the goal in the Bicycle Master Plan of establishing a bicycle facility on Clay Street.

SUMMARY OF FINDINGS AND CONCLUSIONS

- This School Traffic Study has been prepared to evaluate the school-related traffic flows to/from the three schools within the Newport Heights area, as well as the current drop-off / pick-up operations.

- The City of Newport Beach identified an initial list of study intersection and roadway segments. The list was expanded following the public meeting conducted on November 16, 2017. The list was further expanded following a second public meeting conducted on March 14, 2018.

- The following field observations were conducted and data collected:
    - Field observations of Current Drop-off/Pick-up Operations
    - Intersection turning movement counts (Including school-related pedestrian crossings and bicycle counts)
    - Midblock pedestrian, bicycle, and skateboard counts at select locations
    - Review and inventory of school signage
    - Review of crossing guard locations
    - Parking counts
    - Speed data
    - Sight distance analysis at unsignalized intersections along 15th Street (Existing red curb marking locations were noted)

- Field observations were conducted during October 2017 at each of the three schools - Newport Heights Elementary, Ensign Intermediate, and Newport Harbor High School during each of their drop-off and pick-up times.

- Vehicular, pedestrian and bicycle turning movement counts were collected at 20 study intersections with additional pedestrian, bicycle and skateboard counts collected at 9 midblock locations. Existing traffic volumes were collected during the morning peak/School Drop-off period (7:00 to 9:00 AM) and School Pick-up/ evening peak period (2:00 to 6:00 PM) in the months of October 2017, January 2018, and March 2018.

- Existing school-related signs posted along the streets bordering the perimeter of each campus were assessed based on their location, quality, and compliance with the school sign standards in the California Manual on Uniform Traffic Control (CA MUTCD), Chapter 7B. Several signs at each school were identified to be removed or replaced and additional signage will be installed to meet MUTCD standards.

- During school drop-off and pick-up periods, crossing guards are posted at various locations throughout the project vicinity to facilitate pedestrian crossings. From review of pedestrian counts, additional crossing guards at Irvine Avenue at Coral Place and Santa Ana Avenue at 15th Street may be considered, given that these intersections carry over 100 pedestrians during the afternoon school peak hour at Irvine Avenue/Coral Place and in both the morning and afternoon

school peak hours at Santa Ana Avenue at 15th Street. In addition, a recommended measure identified is to provide a new crossing guard at Irvine Avenue at Coral Place.

- Parking counts were collected in September 2017, October 2017, January 2018, and March 2018 between 7:00 AM and 6:00 PM. Streets adjacent to each of the campuses exhibit a high demand for parking throughout the day. The north-south residential streets in the neighborhood show partial occupancy, between 25-75%, throughout the day. Clay Street from Santa Ana Avenue to Irvine Avenue exhibits very light parking activity throughout the day.

- Information regarding existing red curb along both sides of 15th Street was collected and summarized.

- Radar speed data was collected in September 2017, January 2018 and March 2018 during the off-peak times of the day. The Newport Heights area typically has a 25 mile per hour (mph) speed limit through the residential areas, but some sections have posted speed limits of 30 mph. The speeds collected on the study segments are generally reasonable and demonstrate typical moderate speeds for the area. Tustin Avenue between 15th Street and 16th Street is higher than expected. This segment of Tustin Avenue is within the City of Costa Mesa boundary.

- A sight distance field review was performed for the side streets and alleys along 15th Street between Santa Ana Avenue and Irvine Avenue to evaluate the visibility for vehicle movements turning from the side streets and alleys onto 15th Street. The field review demonstrates that a vehicle stopped 15 feet behind the edge of traveled way of the major road on the side streets and alleys along 15th Street will have adequate sight distance, with the exception of one location: looking west from the alley between Fullerton Avenue and Irvine Avenue.

- Recommended measures relating to the each of the three schools, as well as general recommendations relating to on-street parking, pedestrians, signage, crosswalk striping, and bike lane striping have been provided.