

**TO:** Mayor and Councilmembers

**FROM:** Rosemarie Gaglione, Public Works Director

**CONTACT:** Teresa Lopes, Senior Project Engineer

**SUBJECT:** Hollister Avenue Class I Bike Path Project Update

**RECOMMENDATION:**

Direct staff to proceed with the current design with Hollister Avenue as a four lane roadway from Pacific Oaks Rd to Ellwood Elementary School with no bend-outs at any of the intersections, and add curb extensions at all intersections without traffic control signals where the curb to curb width of the minor side street is 40 feet or greater.

**BACKGROUND:**

The Hollister Class I Bikeway Project (Project) will add a Class I bike lane/multi-use path with a 5 foot wide landscaped buffer along the south side of Hollister Avenue from Pacific Oaks Road to Ellwood Elementary School. The Class I bike lane will be in addition to the existing Class II bike lanes along Hollister Avenue. The area south of Hollister Avenue from Pacific Oaks west to Ellwood Elementary is a dense residential neighborhood. A separated bicycle facility along this route is desirable to increase comfort for bicyclists and encourage both bicycle and pedestrian travel. The new Class I bike lane is intended to serve the many school children living south of Hollister who do not use the existing Class II bike lanes, including younger children who may not feel comfortable using a Class II bike lane.

In September 2014, the City was awarded a \$1,644,000 Cycle 1 Active Transportation Program (ATP) grant for project construction. The ATP grant timeline requires that a construction contract must be awarded by September 16, 2016. The City has applied for a construction award time extension to be heard at the August 17 and 18, 2016 California Transportation Commission (CTC) meeting. In the event that a construction award time extension is granted, construction, could be delayed until spring of 2017. Deferring construction to coincide when school is out for summer break would avoid detouring students commuting to and from school and is preferred by staff and the community.

Staff presented project design alternatives to the public at two open house meetings held at Ellwood Elementary School during the preliminary design phase of the Project.

The first meeting was held prior to the beginning of school on August 20, 2014. The second meeting was held after the start of the school year on October 9, 2014. A City Council meeting was also held on February 3, 2015 where various members of the community expressed concerns and desires during the public forum portion of the project discussion. It was through these public outreach efforts that the community expressed a desire for the inclusion of additional crossing treatments such as bend-outs and raised crossings (speed tables) at Palo Alto and Coronado Drives as part of the design.

On June 7, 2016, staff presented an update on the design elements of the Project including the results of the feasibility analysis, which resulted in a recommendation not to install bend-outs at Palo Alto and Coronado Drives, or raised crossings (speed tables) at these locations. Members of the public and the council were frustrated with the loss of these additional design features. Staff was directed to conduct further investigation to analyze additional alternatives which would accommodate the incorporation of bend-outs at all un-signalized intersections.

On June 21, 2016, staff returned to Council with the results of the additional analysis. Further research was conducted regarding the typical use, occurrence, and guidelines for the design of bend-outs. Alternatives were analyzed to accommodate bend-outs at all the un-signalized intersections, including reducing Hollister Avenue to one eastbound (EB) lane from Pacific Oaks Road to Ellwood Elementary School. The results of this further analysis effort determined that even with the reduction to one lane in the EB direction, the bend-out design could not be accommodated at all the un-signalized path crossings without taking additional right of way. The exception was Palo Alto Drive, where sufficient right-of-way exists to incorporate a bend-out design. Council then asked staff to evaluate reducing Hollister Avenue to a single lane in each direction (a lane diet) in order to accommodate the bend-out design at all un-signalized intersections along the Project.

## **DISCUSSION:**

### Bend-out Design Guidelines:

Because separated bike paths, cycle tracks, and bend-outs are a relatively new concept in the U.S., established design guidelines are difficult to come by. FHWA and Caltrans have recently incorporated basic design guides for separated bike lanes, and several other states and local agencies have come up with their own design guides for incorporating separated bike lanes and treatments at intersections. These guidelines are not one case fits all situations. The design guidelines available are just that, "guidelines" to be interpreted to fit each individual situation. Staff researched design guides from other states and countries when looking for more detailed information for the design of bend-outs. The Austroads "Cycling Aspects of Austroads Guide" (2014) provided a good resource as well as the MassDOT Separated Bike Lane Planning and Design Guide (Massachusetts Department of Transportation 2015).

The setback required for a successful bend-out design should provide sufficient room for a vehicle to complete a turn off the main road and stop prior to the path crossing

(without encroaching on it) while having enough queuing space so that they clear the traffic lanes and Class II bike lanes on the main road. Guidelines suggest a range of setback distances from “minimum” to “desired” to accomplish this requirement and these distances varied between the different guidelines. Staff worked with the design engineers of Drake Haglan Associates (DHA) and traffic engineers from several firms to propose a minimum setback distance standard appropriate for this project. A setback of 25 feet is recommended to be the minimum setback necessary to provide sufficient space for the installation of a yield line prior to the path crossing in accordance with the California MUTCD standards, and to provide sufficient space for one larger sized U.S. vehicle to queue clearing the traveled way of Hollister Avenue. The bend-out design for this project was based on this 25 feet setback distance.

Typical bend-out crossing installations provide the right of way (or priority) to the path user. Vehicles are instructed to stop or yield prior to the crossing while users on the path have no stop control. This is also the case at the bend-out crossings for the Class I bike path along the north side of El Colegio Road at the intersections of Camino Pescadero, Embarcadero del Mar, Embarcadero del Norte in Isla Vista. At each intersection the bend-out crossing is setback 50 feet from El Colegio Road and a stop bar and stop sign are installed at each approach to the crossing. In all cases, vehicles must stop prior to the path crossing and the bike path itself is free flowing.

The Hollister Avenue Project cannot provide a 50 foot setback for a bend-out crossing because there is no way to achieve needed sight distance without removing privately owned block walls. The volume of path users projected for the Hollister Project bike path will be considerably less than the number of users on the El Colegio Road bike path. The El Colegio bike path also provides a separate crossing for the pedestrians at the intersection adjacent to El Colegio Road and the setback crossing for bicycles along the Class I bike path. This configuration doesn't require pedestrians to travel the extra distance of the bend out to cross the street, an important factor for younger children, seniors, and those with mobility issues. When the El Colegio Road bike path bend-out was designed there were no existing right of way constraints or improvements such as existing fences, houses or block walls to constrain the design or limit sight distance lines.

The bend-out design crossing was determined to be necessary along El Colegio Road due to the high number of conflicts (path users, pedestrians, and vehicles crossing paths). The extremely high volume of bicycles using the Class I Bike Path made it necessary to find a solution that would relocated the bicycle conflicts away from the intersection. Derek Rapp of Stantec (designer for the El Colegio Class I Bike Path) states that intersections that exceed a range of 80 – 100 conflicting movements per hour are candidate locations for additional treatment (such as bend-out). Intersections which fall below this threshold typically can be handled with highly visible pavement markings and signing. The traffic volumes and projected path user volumes along the Hollister Project will not consist of the high volumes experienced on El Colegio Road. Upon review of the traffic information for the Hollister Project, Stantec stated that though the Hollister Project does not surpass the conflict threshold of 80-100 conflicts, the only intersections within the Project limits which would approach this threshold are the

intersections of Cannon Green Drive and Coronado Drive. These two intersections have the highest peak uncontrolled turning movements. Stantec recommends that if the City were to investigate additional crossing treatments (such as bend-outs) the investigation should be focused on these intersections.

As already noted, the minimum setback proposed for the Hollister Project bend-out crossing is 25 feet. Due to this limited distance, both the bicycle path and pedestrian path users would cross at the bend-out set back location. The Project bend-out design would also require that users along the path to stop at the crossing. The proposed design requires that vehicles yield to the crossing pedestrians and bicyclists when path users are present. Unlike the El Colegio Road bend-out design, the Project design does not include a stop bar and stop sign at the bend-out crossing. These additional features are not recommended due to the limited setback queuing space available. Where there is only enough space for one vehicle to queue in the southbound direction, a stop sign is not recommended.

The previous engineering analysis determined that the only alternatives to provide the 25 foot setback recommended to accommodate the Project bend-out design at all the un-signalized intersections within the project limits would be to: 1) acquire additional right of way; or, 2) further reduce the width of Hollister Avenue and establish the 25 foot setback by pushing the southern edge of the vehicular path of travel further to the north.

The following discussion focuses on the alternative to reduce the width of Hollister Avenue to one lane in each direction, also referred to as “2-laning Hollister Avenue”, “two-lane Hollister”, or a “lane diet”.

In order to analyze the lane diet alternative for Hollister Avenue between Pacific Oaks Road and Ellwood Elementary School, staff engaged the following consultants to assist with this task:

- Derek Rapp – *Stantec*. Derek was the designer involved with the El Colegio Class I bike path bend-out design as well as with other bike path crossings of this nature. He also reviewed conclusions of the project traffic analysis which was conducted in 2014 by Kittelson and Associates, Inc. (Kittelson). He was formerly a traffic engineer with the City of Santa Barbara and has a good rapport with the advocacy groups through working with them while with the City.
- Jim Damkowitch – *Kimley-Horn* – Jim Damkowitch was formerly with Kittelson. He worked on the original Hollister Avenue Class I Bike Path Traffic Operations Analysis which was completed in October 2014. He is also currently preparing the update to the City of Goleta traffic model.
- *Drake Haglan and Associates (DHA)* – DHA looked at design concepts for accommodating bend-outs with a two lane Hollister Avenue at several intersections (see attached exhibits) and also looked at a typical design for accommodating curb extensions (bulb outs) on a typical 40 foot wide side street.

Hollister Avenue Class I Bike Path Traffic Operations Analysis by Kittleson and Associates, Inc.; October 2014:

A traffic analysis was prepared by Kittleson and Associates, Inc. in October of 2014. The report summarized the potential traffic operational implications resulting from a lane diet (a “bi-directional lane reduction”) along Hollister Avenue between Pacific Oaks Road and Ellwood School. The report analyzed this scenario under existing conditions and future 2035 conditions both with the future Goleta 101 Overcrossing Project and without the 101 Overcrossing Project.

***Key Findings from the 2014 Traffic Study:***

The Kittleson report concludes that under existing conditions with a two-lane Hollister Avenue, the Cannon Green intersection degrades from Level of Service (LOS) D to LOS E.

The proposed two-lane Hollister Avenue under the 2035 future scenario would degrade peak hour operations to exceed the City’s impact threshold criteria (the infrastructure would not acceptably handle the traffic) at the following three intersections:

- Pacific Oaks Road
- Cannon Green Drive
- Coronado Drive.

Mitigations necessary under this scenario would include:

Two traffic lanes at Pacific Oaks to mitigate the traffic operation impacts; and,

A continuous two-way center left-turn lane between Pebble Beach Drive and Pacific Oaks Road would improve LOS at the un-signalized intersections, such as Coronado Drive. A two-way center turn lane, would allow two-stage gap acceptances to the side street traffic; and,

A signal at Cannon Green Drive.

The traffic report also determined that the segment LOS between Pacific Oaks Road and Entrance Road with the 101 overcrossing scenario for the year 2035 would exceed the City’s General Plan threshold of requiring a maximum volume of 14,300 Average Daily Traffic (ADT) for a two lane roadway.

Another concern which was not addressed in the traffic report is that reducing Hollister Avenue to one lane between Pacific Oaks Road and Entrance Road would prohibit the ability to make U-turns to access the businesses on the north side of Hollister Avenue if raised medians were to be placed. A two-way center left turn lane would be necessary to maintain this access.

Project Design Analysis - Lane Diet Along Hollister Avenue to Accommodate Bend-Outs:

Due to the issues and concerns discussed in the traffic report which would occur between Pacific Oaks Road and Entrance Road with a single lane in each direction, staff evaluated the possibility of a lane diet on Hollister Avenue west of Entrance Road only and maintaining the four lane configuration from Entrance Road east to Pacific Oaks Road. The benefit gained with providing a two lane Hollister in this section is additional space for a bend-out at Cannon Green Drive and a bend-out at Lowell Way, a street which serves only a few homes and has very low traffic volumes. Due to the low volumes and low occurrence of potential conflicts (between path users and turning vehicles) at Lowell Way, a bend-out at this location would offer far less benefit than the negative impacts to the operations on Hollister Avenue. A bend-out design could be accommodated at Cannon Green Drive, however, the bend-out would need to be removed if a traffic signal is approved for this intersection at some point in the future. Having a signal would require the bend out to be pushed out to 50 feet from the intersection, like those on El Colegio, and it would be likely that there would be insufficient sight distance to accommodate vehicle storage. There could also be problems with the left turn phase off of Hollister Avenue as a result.

The two-lane Hollister Avenue scenario was then considered west of Entrance Road between Entrance Road and Pebble Beach Drive. Under this scenario, a typical section of a two lane Hollister Avenue would consist of 12 foot lanes, a 14 foot two-way left turn lane, and 6 foot Class II bike lanes. This would accommodate bend-outs at the Santa Barbara Shores, Palo Alto, and Coronado Drive intersections. In each case a minimum set back of 25 feet from the edge of traveled way to the bend-out crossing could be provided. A bend-out could not be accommodated at Pebble Beach Drive as this is the area where Hollister Avenue currently drops down to two lanes in the existing condition, and sufficient roadway width is not available to provide the recommended minimum setback to the bend-out. Bend-outs are not recommended at any streets east of Entrance Road. See Figure 1 for the typical bend-out design and Figure 2 for the transition to the proposed two lane Hollister Avenue section which would occur east of Pebble Beach Drive.

Project Impacts and/or Tradeoffs of Reducing Hollister Avenue to Two Lanes for the Purpose of Accommodating Bend-outs:

The main goal of the Hollister Avenue Class I Bike Path Project is to balance travel modes (vehicular, pedestrian and bicycle) and increase safety for path users as well as all travelers in the right of way.

Even though the traffic analysis shows that under certain scenarios and with certain mitigation measures, a two lane Hollister Avenue can be made to meet the upper threshold limits for traffic operations, this does not mean there will not be impacts to traffic operations along Hollister Avenue through the two lane section. The following potential impacts have been identified:

- With a two lane Hollister Avenue there will be higher traffic volumes in the single through lane on Hollister Avenue resulting in fewer gaps for left turns into and out of the side streets. All turns would experience a higher delay waiting to turn onto or off of Hollister Avenue. Traffic delays on the side streets may not be acceptable to the daily user.
- Left turns out of the side streets and driveways would be required to make a “two-stage” turn in which the vehicle turns out of the side street or driveway and into the center, shared turn lane to wait for a gap to enter the through traffic lane on Hollister Avenue. Many motorists are not comfortable using center turn lanes in this manner.
- The installation of a two-way left turn lane as a required mitigation measure to serve a two lane Hollister Avenue will eliminate at least one of the proposed raised landscaped medians.
- There is a concern regarding left turning westbound traffic off of Hollister Avenue and the perception of the space available for the queuing area between the bend-out crossing and the Hollister Avenue edge of traveled way. During peak hours there will be fewer gaps sufficient for left turning vehicles. A driver, upon identifying an adequate gap to execute their turn, will accelerate through the turn to cross Hollister Avenue but then will encounter another conflict (the bend-out crossing) 25 feet into the side street. The vehicle would have just accelerated through their turn, and will be faced with the situation of having to quickly stop if a path user is in the crossing. The 25 foot setback does not give sufficient queuing length for more than one vehicle, so during the peak hour if more than one vehicle tries to take advantage of this gap to turn left there is a potential for inadequate queuing on the side street if the first vehicle has to yield to cross traffic at the path.

Staff is investigating whether this change in the Project (from a 4 lane Hollister Avenue to a 2 lane Hollister Avenue) will still be covered by the Categorical Exemption (CE) filed for the Project earlier this year. This change may require further environmental review.

#### Curb Extensions (Bulb-outs):

Curb extensions on the minor streets were evaluated as an additional path crossing treatment for all the un-signalized intersections along Hollister Avenue. The concept of a curb extension was analyzed earlier in the project design process and it was determined at that time that it would be difficult to accommodate the turning radius of larger trucks. However, with additional engineering analysis by the new designer, and some modifications to the original design, staff concluded that curb extensions were a viable option. The results of the feasibility analysis are as follows:

- Curb extensions can be consider as an alternative to the bend-outs at the un-signalized crossings.
- The curb extensions would provide increased pedestrian and bicyclist visibility, would shorten the crossing distance necessary across the side

streets and would prohibit parking near the crossing, thereby improving visibility of the crossing from all directions.

- The same signing and visual crossing pavement marking treatments would be used at the curb extension crossings
- DHA designed a typical curb extension for a 40 foot street (See Figure 3) and determined that the bulb-out could be accommodated at locations where the side street has a minimum curb to curb width of 40 ft. This includes Santa Barbara Shores Drive, Palo Alto Drive, Coronado Drive, Cannon Green Drive and Lowell Way. The typical bulb-out design will not work at Pebble Beach due to a street width of 34 feet from curb to curb.
- The curb extension design included the truck turn radius for a large motorhome or garbage truck as the design vehicle. The curb return radii are 20 feet for the right turn into the side-street and 25 feet for the right turn out of the side street.
- Curb extensions are not proposed at existing signalized intersections.
- A curb extension constructed at Cannon Green Drive would have to be removed in the event that a traffic signal is approved for this intersection at a future date.

Meeting with Advocacy Groups – Santa Barbara Bicycle Coalition (SBBIKE) and the Coalition for Sustainable Transportation (COAST):

A follow-up meeting was held with staff and SBBIKE and COAST on June 30 to present the status of the alternatives analysis and to discuss the issues and concerns related with reducing Hollister Avenue to two lanes west of Entrance Road. Derek Rapp was present to provide insight into the use of bend-outs as a crossing treatment and to give background on the design of the bend-out at El Colegio Road.

The advocacy group attendees (SBBIKE and COAST representatives) stated that they were in favor of the bend-outs because they believed they would increase safety for the crossings by providing an area for vehicles to stop prior to the crossing. Mr. Rapp explained that there is not a sufficient amount of reliable safety data to effectively measure the benefits of bend-outs in the United States. It was discussed that in addition to bend-outs other alternative crossing treatments such as brightly colored or highly visible pavement marking and signing and the addition of curb extensions (bulb-outs) were also considered to be effective at reducing crossing conflicts and increasing visibility for all users. The following generalizations were results of the meeting discussions:

- The attendees preferred the addition of bend-outs as a crossing treatment but understood the issues and drawbacks associated with trying to accommodate them.
- The attendees were in favor of enhanced signing and pavement markings at the crossings and the idea of marking separate pedestrian crossing and bicycle crossing.

- The attendees would consider the addition of curb extensions (bulb-outs) if the bend-out could not be included in the design. They were also in favor of eliminating parking at the approaches to the crossings to increase visibility.
- The attendees stated that they were in favor of reducing Hollister Avenue to two lanes regardless if bend-outs were included in the design or not.

#### Design Status:

The project is in the final stages of design, pending further direction from Council. Staff would plan to advertise this project for bids by the end of July. Due to cost considerations, staff recommends soliciting bids based on the core Project design with additive bid alternative items which would allow for the installation of conduit and pull boxes to accommodate a future project to install path lighting fixtures along the project limits and to include colored/and or stamped concrete along the pedestrian portion of the path if the bid results are favorable. Conduit and pull boxes for the future traffic signal at Cannon Green will be included in the base bid.

#### **FISCAL IMPACTS:**

The estimated project cost for the bike lane and median work, not including the additive items or the pavement rehabilitation work proposed as a concurrent project, is approximately \$3.46 million, including design engineering and construction. A variety of funding sources have been identified to fund the project, including an ATP grant of \$1.644 million to fund estimated construction costs of \$3.1 million. A budget amendment will be necessary at contract award to fund the additional pavement rehabilitation scope of work.

#### **ALTERNATIVES:**

The recommendation to proceed with the current design with Hollister Avenue as a four lane roadway from Pacific Oaks Rd to Ellwood Elementary School and to add curb extensions at all intersections without traffic control signals represents what staff has determined best meets the goal of maximum safety for bicyclists and pedestrians, while minimizing negative impacts to drivers, therefore achieving the goal of accommodating all users. However, Council may direct staff to redesign the project to reduce Hollister Avenue from four lanes to two lanes between Entrance Road and Ellwood Elementary School, incorporate the Project bend-out design at the path crossings of Santa Barbara Shores Drive, Palo Alto Drive and Coronado Drive. Alternatively, Council may choose to direct staff to proceed with the current design with Hollister Avenue as a four lane roadway from Pacific Oaks Rd to Ellwood Elementary School with no bend-outs or curb extensions at any of the intersections.

Council may also direct staff to defer this project until more thorough engineering analysis and community outreach is conducted and Council can consider design elements in a workshop format. If Council elects not to provide staff direction for the project design at this time and to instead continue further engineering analysis, the City may forfeit the \$1.644 ATP grant for project construction. Further analysis would increase the Project budget and time before the Project can be constructed.

Legal Review By:

Approved By:

  
\_\_\_\_\_  
Tim W. Giles  
City Attorney

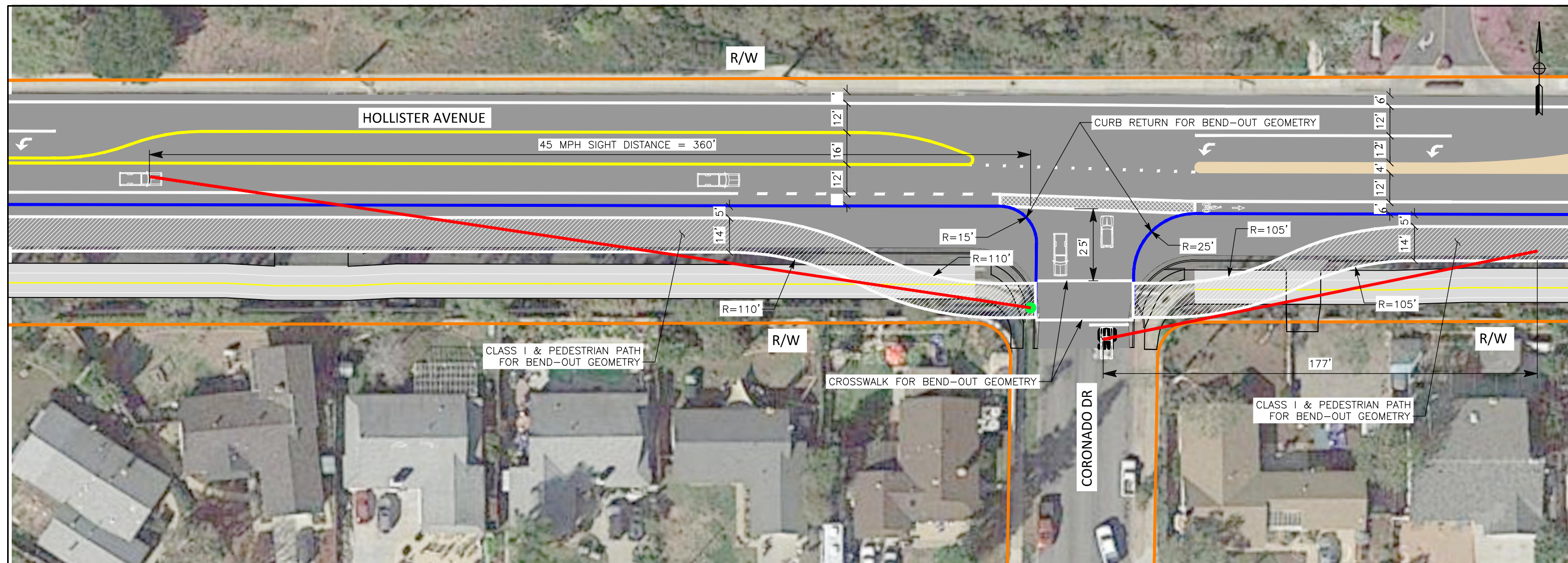
  
\_\_\_\_\_  
Michelle Greene  
City Manager

**ATTACHMENTS:**

1. Figure 1- Typical Bend-out design with a two lane Hollister Avenue
2. Figure 2 – Transition to a two lane Hollister Ave east of Pebble Beach Drive
3. Figure 3 – Typical Curb Extension (Bulb-out) at a 40 foot wide street.

## **Attachment 1**

Figure 1- Typical Bend-out design with a two lane Hollister Avenue



HOLLISTER AVE/CORONADO DR INTERSECTION  
BEND-OUT TURNING MOVEMENT WITH ONE WESTBOUND & EASTBOUND LANE

**Figure 1**

**LEGEND**

- R/W
- LINE OF SIGHT
- CLASS I & PEDESTRIAN PATH FOR BEND-OUT GEOMETRY
- TRAVEL PATH OF CLASS II BIKE LANE AT INTERSECTION
- LOCATION OF BICYCLIST/PEDESTRIAN ON CURB RAMP

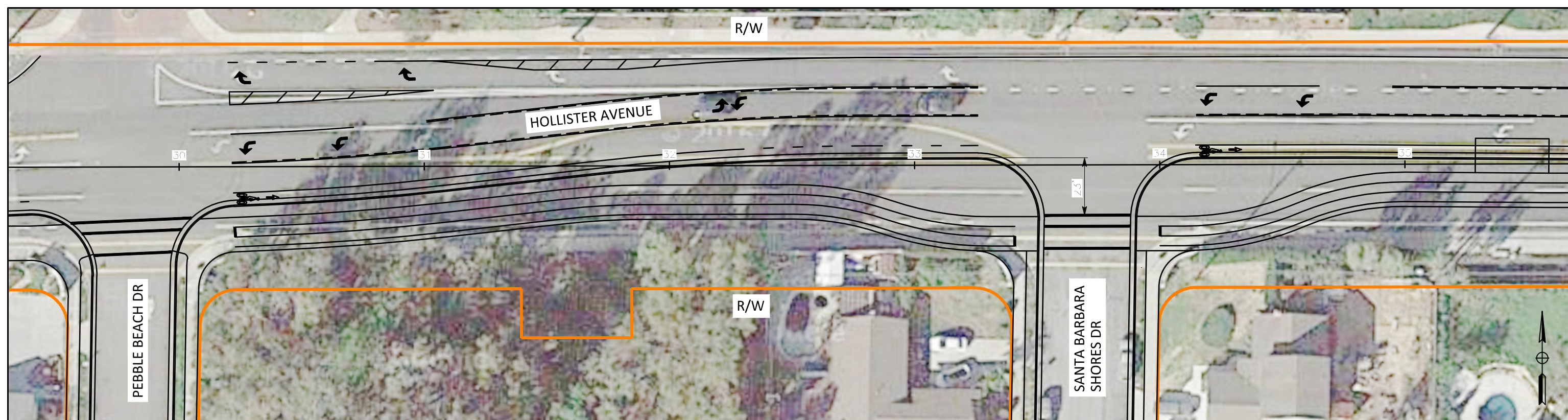
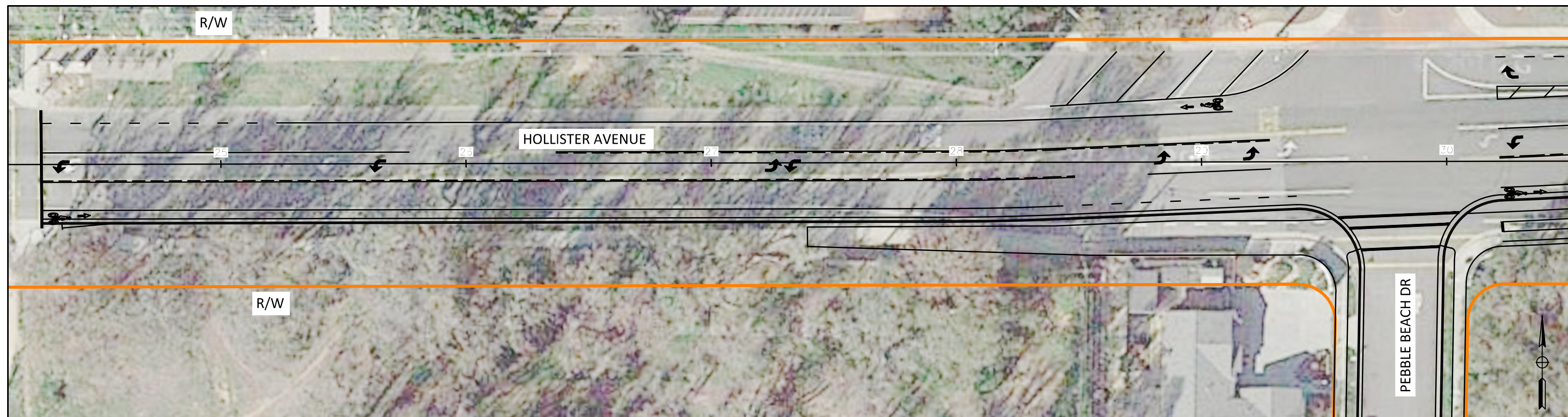
# HOLLISTER AVE CLASS I BIKE/PEDESTRIAN IMPROVEMENTS

SCALE: 1"=20'

06/23/2016  
SHEET 1 OF 1

## **Attachment 2**

Figure 2 – Transition to a two lane Hollister Ave east of Pebble Beach Drive



HOLLISTER AVE/SANTA BARBARA SHORES DR INTERSECTION  
BEND-OUT TURNING MOVEMENT WITH ONE WESTBOUND & EASTBOUND LANE

FIGURE 2

LEGEND

R/W

# HOLLISTER AVE CLASS I BIKE/PEDESTRIAN IMPROVEMENTS

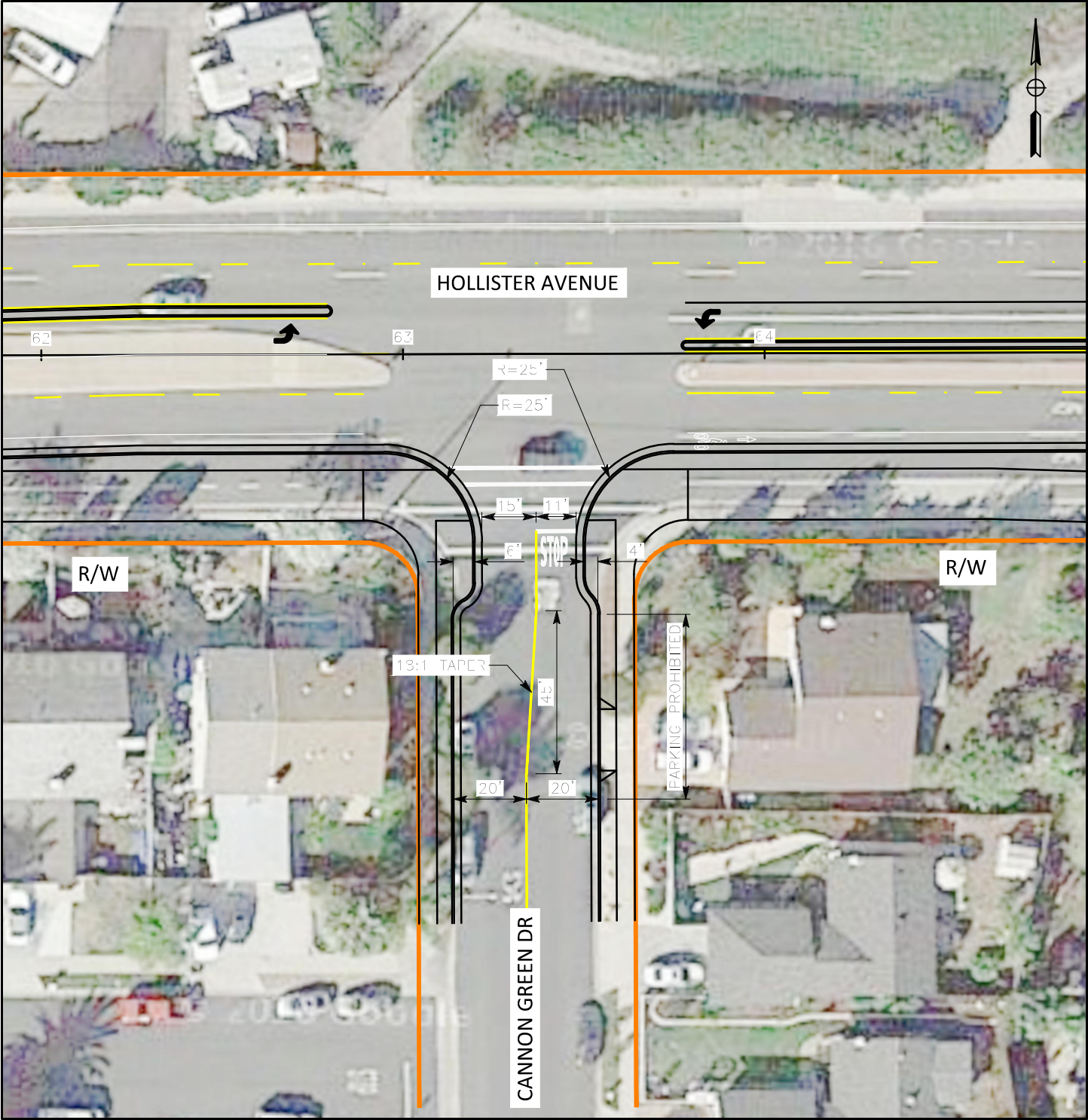
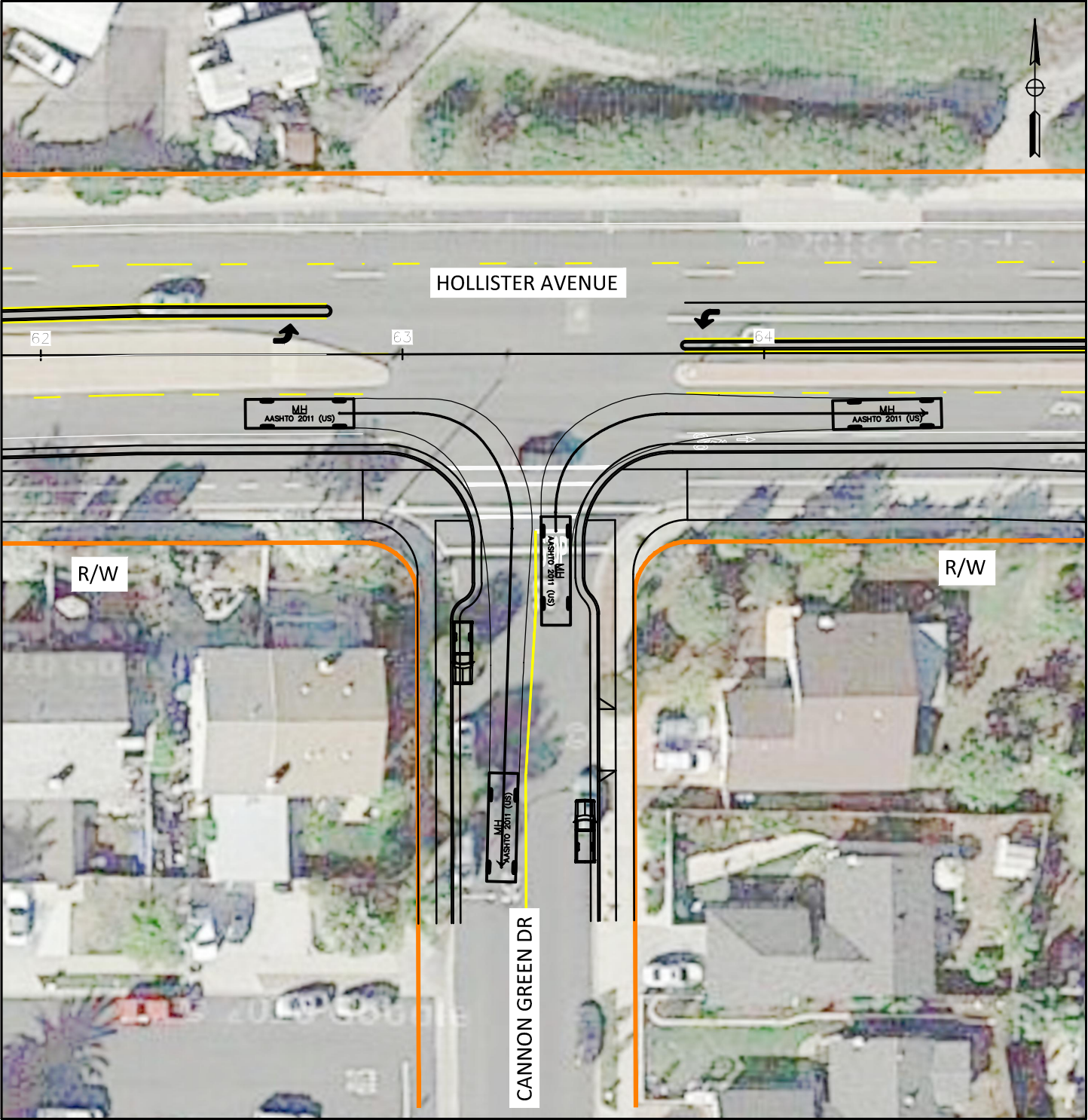
SCALE: 1"=20'

06/30/2016  
SHEET 1 OF 1

### **Attachment 3**

Figure 3 – Typical Curb Extension (Bulb-out) at a 40 foot wide street.

NOTE:  
1. DESIGN VEHICLE = AASHTO 2011 MOTORHOME



TYPICAL BULB-OUT LAYOUT  
EXHIBIT

FIGURE 3

LEGEND

 R/W

HOLLISTER AVE  
CLASS I BIKE/PEDESTRIAN IMPROVEMENTS

SCALE: 1"=20'

07/01/2016  
SHEET 1 OF 1