# APPENDIX F

Village Specific Plan
Circulation Plan
Final Draft

December 15, 2021

Prepared for

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# VILLAGE SPECIFIC PLAN

## Circulation Plan

## FINAL DRAFT

Prepared by:

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Prepared for:

Terra Nova

Town of Apple Valley

December 15, 2021

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## I. Introduction

This report has been prepared in support of the Specific Plan, to establish goals and implementing policies for the plan area's circulation and parking systems, describe the multimodal Circulation Plan, and define development standards for private development and a public parking strategy. The circulation system is based on the principles of Complete Streets which emphasizes a transportation system that accommodates "all users" including the private vehicle, public transportation, and the active transportation modes of bicycling and walking. The notion of accommodating all users also encompasses freight movement and emergency response and thus balances design for large vehicles with safety enhancements for the most vulnerable users.

A sustainable transportation system offers the traveler viable mobility choices by ensuring that the systems serving each mode are equally comprehensive in their connectivity, accessibility, and coverage as well as being safe and attractive. The concept of complete streets does not always mean that every street is designed for all users in precisely the same way. Different streets might emphasize different modes of transportation for efficiency and performance and then combined to provide optimal connectivity for the community. Layering modal networks is considered a best practice in implementing Complete Streets principles, helping to optimize networks and the function of individual streets where competing modal priorities arise.

## II. Circulation Plan Description

### A. Specific Plan Area Circulation Concept

This section describes the multimodal circulation concept for the Specific Plan area. The armature of the Circulation Plan is the existing street network comprising a grid of major and minor streets. One of the most distinguishing circulation system features is that State Route (SR) 18 bisects the Specific Plan area. SR 18 is an important corridor of regional significance for Apple Valley and the High Desert area but, locally, it is a significant impediment to walking because of its 200-foot right of way and nearly ½-mile distance between protected crossings. The remaining streets in the Specific Plan area form a somewhat uniform grid resulting in block sizes ranging from 1,000 by 1,200 feet to 350 by 1,200 feet.

#### 1. Circulation Plan Overview

The Specific Plan Circulation Plan is presented in two alternatives. Alternative 1 advances the "all roundabouts on Highway 18" option developed as part of the State Route 18 Corridor Enhancement Plan and Alternative 2 assumes the "all traffic signals on Highway 18" option.

Circulation Plan Alternative 1 (All Roundabouts on Highway 18)

Circulation Plan Alternative 1 is depicted in **Figure 1** and key features of the plan are described below.

- Roundabouts comprise the intersections on Highway 18 from the realignment of Yucca Road in the west to Central Road in the east. Multi-lane roundabouts are used at intersections with major thoroughfares (Yucca Loma Road, Navajo Road, and Central Road) and single lane roundabouts are used at intersections with local streets (Pawnee Road, Quinault Road, Hitt Road / Realigned Headquarters Drive).
- Alternative 1 incorporates two roadway realignment projects, including realigning Yucca Loma Road to Highway 18 and extending Yucca Loma Road to intersect Navajo Road at Arapahoe Avenue. Additionally, Headquarters Drive is realigned to intersect Highway 18 at Hitt Road. The realignment projects are described in detail below.
- The Outer Highway 18 frontage roads remain in this alternative but are widened and reconfigured as one-way streets with diagonal parking lining one side of each street. Access to and from the frontage roads employs ramps near the roundabout entries and exits.


Apple Valley Village Specific Plan

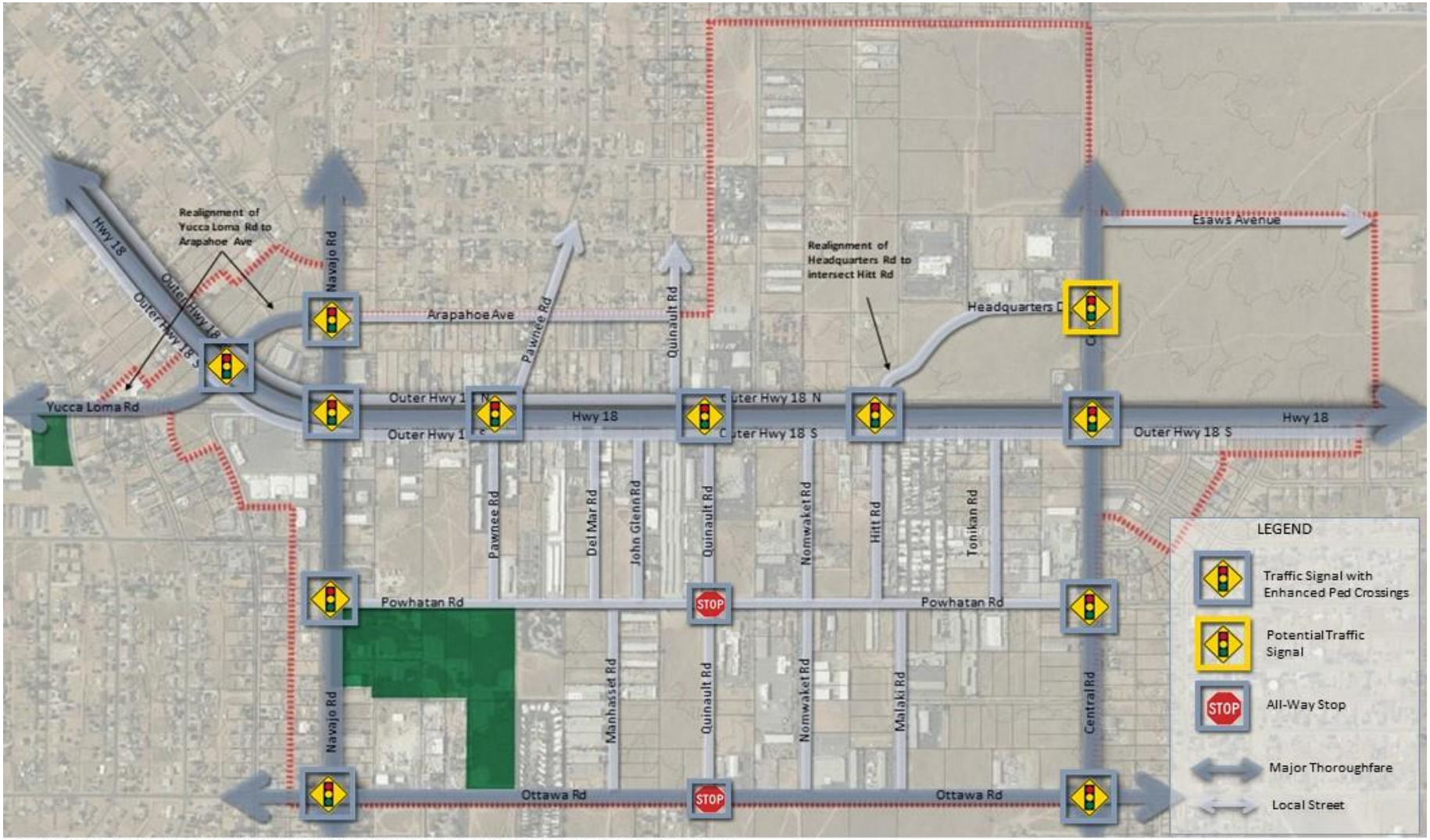
**Figure 1**
**Circulation Plan Alternative 1**
(Highway 18 All Roundabouts Alternative)

- Powhatan Road may potentially be widened to four lanes and designated as a major thoroughfare should it be required to relieve traffic demand on Highway 18 due the constriction of Highway 18 to a single lane in each direction between Navajo Road and Central Road. Should this occur the intersection of Powhatan Road and Central Road would be signalized.
- New traffic signals are identified on Ottawa Road at Navajo Road and Central Road and at Central Road / Headquarters Drive. All way stop control is proposed on Quinault Road at Powhatan Road and Ottawa Road.
- Pedestrian crossing enhancements are proposed at roundabouts and at new and existing signalized intersections. Pedestrian features of the Circulation Plan are described in the Active Transportation Plan pedestrian network section below.
- The narrowing of Highway 18 to a single lane in each direction (and burying the existing drainage channels on both sides on the highway) provides space to improve the frontage roads as described above and to integrate a multi-use path and urban design features within the right of way on the south side of Highway 18. Bicycle features of the Circulation Plan are described in the Active Transportation Plan bicycle network section below.

Circulation Plan Alternative 2 (All Signals on Highway 18)

Circulation Plan Alternative 2 is depicted in **Figure 2** and key features of the plan are described below.

- Alternative 2 shares many of the same features as Alternative 1 with the primary difference being the configuration and intersection control on Highway 18 and maintaining a four-lane configuration throughout the Specific Plan area.
- Traffic signals provide intersection control along Highway 18. New signalized intersections (with protected pedestrian crossings) are located at the Yucca Loma realignment to Highway 18 and at Navajo Road, the intersection of Highway 18 with Pawnee Road, and at the intersection resulting from the realignment of Headquarters Drive to Highway 18 at Hitt Road. Additional new traffic signals are identified at Central Road and Powhatan Road, Central Road and Headquarters Drive, and on Ottawa Road at Navajo Road and Central Road. All way stop control is proposed on Quinault Road at Powhatan Road and Ottawa Road.
- As in Alternative 1, the Outer Highway 18 frontage roads remain in Alternative 2 but are widened and reconfigured as one-way streets with diagonal parking lining one side of each street. Access to and from the frontage roads employs ramps before and after each signalized intersection.
- In Alternative 2, Powhatan Road remains a local street since it is not proposed to relieve traffic demand from Highway 18.
- Pedestrian crossing enhancements are proposed at new and existing signalized intersections. Pedestrian features of the Circulation Plan are described in the Active Transportation Plan pedestrian network section below.
- In this alternative, Highway 18 remains a four-lane thoroughfare with left turn bays, so the street does not gain the additional space that Alternative 1 does by reducing the number of through lanes. However, Alternative 2 provides bicycle facilities in the form of Class II bike lanes in each direction of Highway 18 and/or through a multi-use path within space gained by burying the existing drainage channels on both sides on the highway. Bicycle features of the Circulation Plan are described in the Active Transportation Plan bicycle network section below.




Refer to the Active Transportation section in the Circulation Plan for pedestrian and bicycle system.

Apple Valley Village Specific Plan

**Figure 2**
**Circulation Plan Alternative 2**
(Highway 18 All Traffic Signals Alternative)

2. Street Classifications

The Town of Apple Valley's General Plan establishes a hierarchy of eight street functional classifications (Policy 1.A) of which four classifications are found within the Specific Plan area (Major Divided Arterial, Major Road, Secondary Road, and Local Street). For simplification, the Circulation Plan combines Major Divided Arterial and Major Road into a single class of Major Thoroughfares and combines Secondary Road and Local Street into the class Local Streets. The streets in the Specific Plan area maintain their General Plan classification characteristics such as right of way, general number of lanes, median treatment, etc.

The street classifications within the Specific Plan area are the same in both alternatives and are defined in **Table 1**.

Table 1: General Plan Characteristics of Specific Plan Area Street Classifications

| Specific Plan Designation | General Plan Street Classifications | Streets Within Specific Plan Area by Designation† | Standard Right of Way | No. of Lanes | Sidewalk and Parkway Width | Bike Lane or Parking Lane Width |
|---|---|---|---|---|---|---|
| Major Thoroughfare | • Major Divided Arterial<br>• Major Road<br>• Secondary Road | • Highway 18*<br>• Navajo Road<br>• Central Road<br>• Ottawa Road<br>• Yucca Loma Road | 128 feet<br>104 feet<br>88 feet | 6<br>4<br>4 | 12 ft<br>12 ft<br>12 ft | 8-10 ft<br>8-10 ft<br>8 ft |
| Local Street | • Local Street | • Outer Highway 18 North*<br>• Outer Highway 18 South*<br>• Powhatan Road<br>• Headquarters Drive<br>• Arapahoe Avenue<br>• Quinault Road<br>• Del Mar Road<br>• John Glenn Road<br>• Nomwaket Road<br>• Hitt Road<br>• Tonikan Road<br>• Manhasset Road<br>• Malaki Road | 60 feet | 2 | 12 ft | †† |

Notes:

† The identified local streets within the Specific Plan area are not a complete list. The local streets listed are primary pedestrian routes.

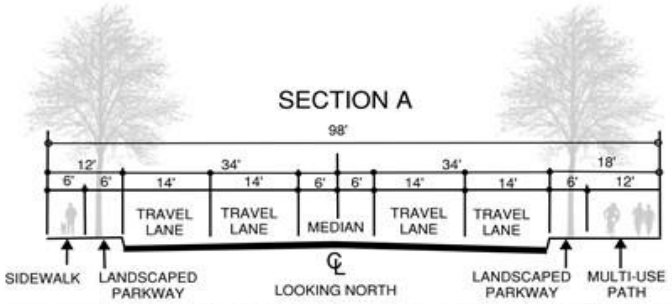
* Highway 18 and Outer Highway 18 (north and south), although designated a Major Divided Arterial in the General Plan circulation element, is a major arterial street with frontage roads that operate together as if a single street. The combined right of way is approximately 212 feet.

†† The General Plan does not specify the width of bike of parking lanes on local streets. Local streets have a 36 ft. traveled way (18 ft. in each direction) which typically accommodates on-street parking (approx. 7 ft.). Designated (Class II) bike lanes would require parking restrictions. When designated as part of the bikeway system, local streets are usually classified as a Class III bike route / shared roadway.

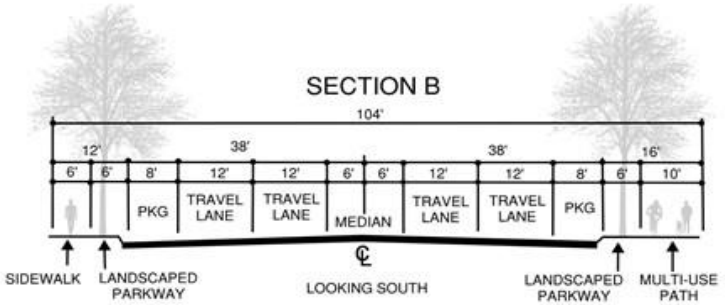
3. Typical Street Sections Within Specific Plan Area

Streets within the Specific Plan area will generally maintain the right of way as specified in the General Plan street classifications but the allocation of the right of way to different street components varies depending on the modal emphasis of the street and priority of on-street parking within the District the street serves.

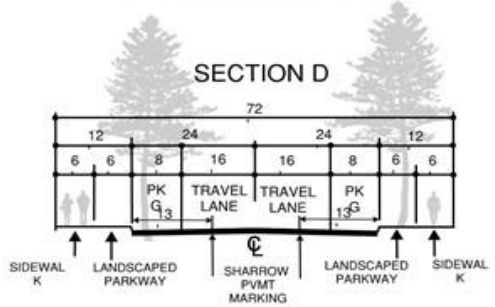
**Figure** *3* illustrates typical street sections for major thoroughfares and local streets within the Specific Plan area excluding Highway 18. Design alternatives for Highway 18 are addressed in the next section.



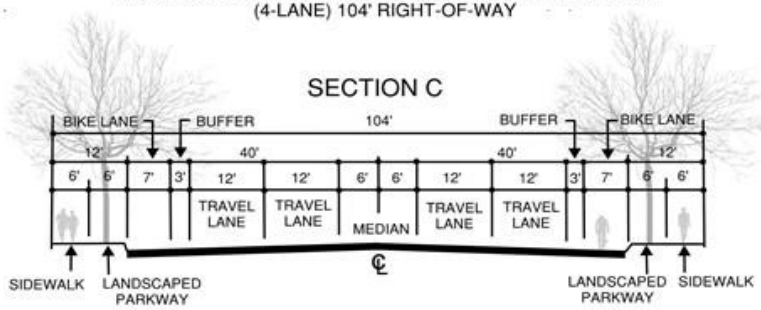

MAJOR DIVIDED ARTERIAL WITH PARALLEL MULTI-USE PATH EAST SIDE
(4-LANE) 98' RIGHT-OF-WAY



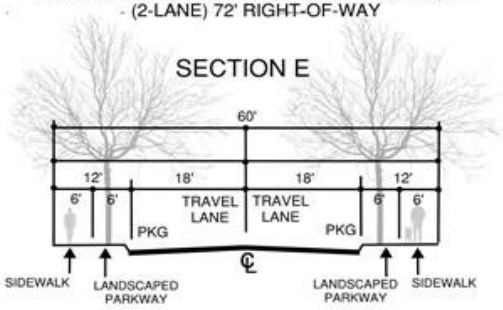

MAJOR ROAD WITH PARALLEL MULTI-USE PATH WEST SIDE
(4-LANE) 104' RIGHT-OF-WAY



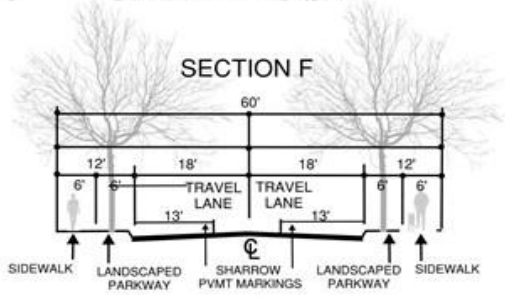

SECONDARY ROAD WITH CLASS III BIKE ROUTE
(2-LANE) 72' RIGHT-OF-WAY




MAJOR ROAD WITH CLASS IV SEPARATED BIKE LANES
(4-LANE) 104' RIGHT-OF-WAY




LOCAL STREET - PRIMARY PEDESTRIAN ROUTE
(2-LANE) 60' RIGHT-OF-WAY




LOCAL STREET WITH CLASS BIKE ROUTE / SHARED LANES
(2-LANE) 60' RIGHT-OF-WAY

**Figure 3**
**Specific Plan Street Classifications and Sections**

Typical Sections for Specific Plan Major Thoroughfares and Local Streets

**Table 2** summarizes key characteristics of the Specific Plan street classifications in tabular form.

Table 2: General Characteristics of Specific Plan Street Classifications

| Section Fig. 3 | Street Type | Example | Right of Way | Traveled Way | Number of Lanes | Parking Allowed |
|---|---|---|---|---|---|---|
| **Major Thoroughfares** | | | | | | |
| A | Major Divided Arterial - with Parallel Multi-Use Path | Navajo Road bet Ottawa Road and Highway 18 | 98’ | 68’ | 4 | No |
| B | Major Road with Parallel Multi-Use Path | Navajo Road bet Ottawa Road and Highway 18 | 104’ | 76’ | 4 | Yes |
| C | Major Road with Class IV Separated Bike Lanes | Navajo Road north of Highway 18 | 104’ | 80’ | 4 | No |
| D | Secondary Road with Class III Bike Route / Shared Lanes | Ottawa Road between Navajo Road and Central Avenue | 72’ | 48’ | 2 | Yes |
| **Local Streets** | | | | | | |
| E | Local Street – Primary Pedestrian Route | Pawnee Road bet Highway 18 and Powhatan Road | 60’ | 36’ | 2 | Yes |
| F | Local Street with Class III Bike Route / Shared Lanes | Quinault Road bet Highway 18 and Powhatan Road | 60’ | 36’ | 2 | yes |

B. New Street Connections and Realignments

As described in the overview, the Circulation Plan alternatives include two street realignment projects.

1. Yucca Loma Road Realignment to Highway 18

This improvement realigns Yucca Loma Road to intersect SR-18 at a new intersection. A new north leg of the intersection extends to intersect with Navajo Road as shown in **Figure 4** which shows the realignment in both Alternative 1 (All Roundabouts) and Alternative 2 (All Signals). This improvement simplifies the current complex multi-approach intersection of SR 18 / Outer Highway 18 South / Navajo Road / Yucca Loma Road.

The current configuration with six approaches is a consolidation of three intersections, the signal-controlled intersection of Highway 18 and Navajo Road, the stop-controlled intersection of Navajo Road and Outer Highway 18 North, and the stop-controlled intersection of Navajo Road and Outer Highway 18 South / Yucca Loma Road. The intersection is operationally inefficient, confusing, and restricted vehicular movements on some approaches force motorists into circuitous routes to return to Highway 18. Pedestrians crossing Highway 18 must cross in multiple stages and are exposed to traffic during the 200-foot-long crossing. This intersection is simplified by dividing it into two intersections that can be either roundabouts or conventional signalized intersections. However, only the roundabout alternative eliminates the frontage road intersections.

A new intersection is created by realigning Yucca Loma Road to intersect Highway 18 at a new intersection and further extending Yucca Loma Road northward to intersect the Navajo Road at a new traffic signal. As shown in **Figure 4**, traffic can bypass the Highway 18 / Yucca Loma Road intersection using ramps connecting Yucca Loma Road directly to Highway 18. The existing intersection of Highway 18 and Navajo Road is converted to a conventional four-leg signalized intersection or roundabout with standard features familiar to motorists and pedestrians.

Benefits include:

- Improved intersection operations having to accommodate four approaches rather than six.
- Improved multimodal connectivity at the western gateway to the Specific Plan area.
- Space for multi-use path. Realignment of Yucca Loma Road and abandonment of existing alignment combined with reconfiguration of frontage roads provides space for a multi-use path south of Highway 18.

The Yucca Loma Road realignment can be implemented in either of the Highway 18 corridor alternatives (All Roundabouts or All Signals) but the roundabout alternative results in some key benefits that cannot be achieved with traffic signals.

Benefits exclusive to the roundabout alternative:

- Improved pedestrian comfort crossing Highway 18. Pedestrians cross in multiple stages with each stage crossing only two lanes of traffic coming from one direction with refuge islands between stages.
- Improved intersection safety. Collisions will likely be reduced by eliminating the stop-controlled approaches of the Outer Highway 18 intersections and eliminate most of the conflicts between movements normally controlled by the existing signal and existing stop signs.

2. Headquarters Drive Realignment

This improvement realigns Headquarters Drive to intersect Highway 18 and creates a new four leg intersection with Hitt Road as illustrated in **Figure 5**. This project eliminates the circuity and out of direction travel created by the existing connection of Headquarters Drive to Outer Highway 18 North and provides a new control point (either with a roundabout or a traffic signal) permitting full vehicular movements and a pedestrian crossing of Highway 18.


In Alternative 1, the realignment of Yucca Loma Road to Highway 18 eliminates the existing six leg intersection of SR 18 / Outer Highway 18 South / Navajo Road / Yucca Loma Road and replaces it with a multi-lane roundabout.


In Alternative 2, the realignment of Yucca Loma Road to Highway 18 simplifies the existing six leg intersection of SR 18 / Outer Highway 18 South / Navajo Road / Yucca Loma Road and replaces it with a conventional four leg signalized intersection.

**Figure 4**
**Realignment of Yucca Loma Road with Highway 18**
**Under Alternative 1 and Alternative 2**


In both Alternatives 1 and 2, the realignment of Headquarters Drive to intersection Highway 18 across from Hitt Road improves access to the land north of Highway 18, provides a new connection between the north and south sides of Highway 18, and most importantly, it dramatically shortens the nearly ½-mile stretch of Highway 18 without a pedestrian crossing.

**Figure 5**
**Realignment of Headquarters Drive with Highway 18 and Hitt Road Under Alternative 1 and Alternative 2**

C. SR 18 Corridor Enhancement Plan Alternatives

The State Route 18 Corridor Enhancement Plan evaluated alternative corridorwide improvement concepts to address the number of obstacles created by the corridor's current configuration. The Plan presented five alternative concepts ranging from conventional to less conventional concepts. The Town, stakeholders and community members involved in the Corridor Enhancement Plan agreed that two of the more conventional improvement concepts (roundabouts and traffic signals) were the most viable. The Circulation Plan incorporates both alternative concepts, with some modification, which will be evaluated in further detail in the Specific Plan's transportation analysis.

1. Alternative 1 - All Roundabouts on Highway 18

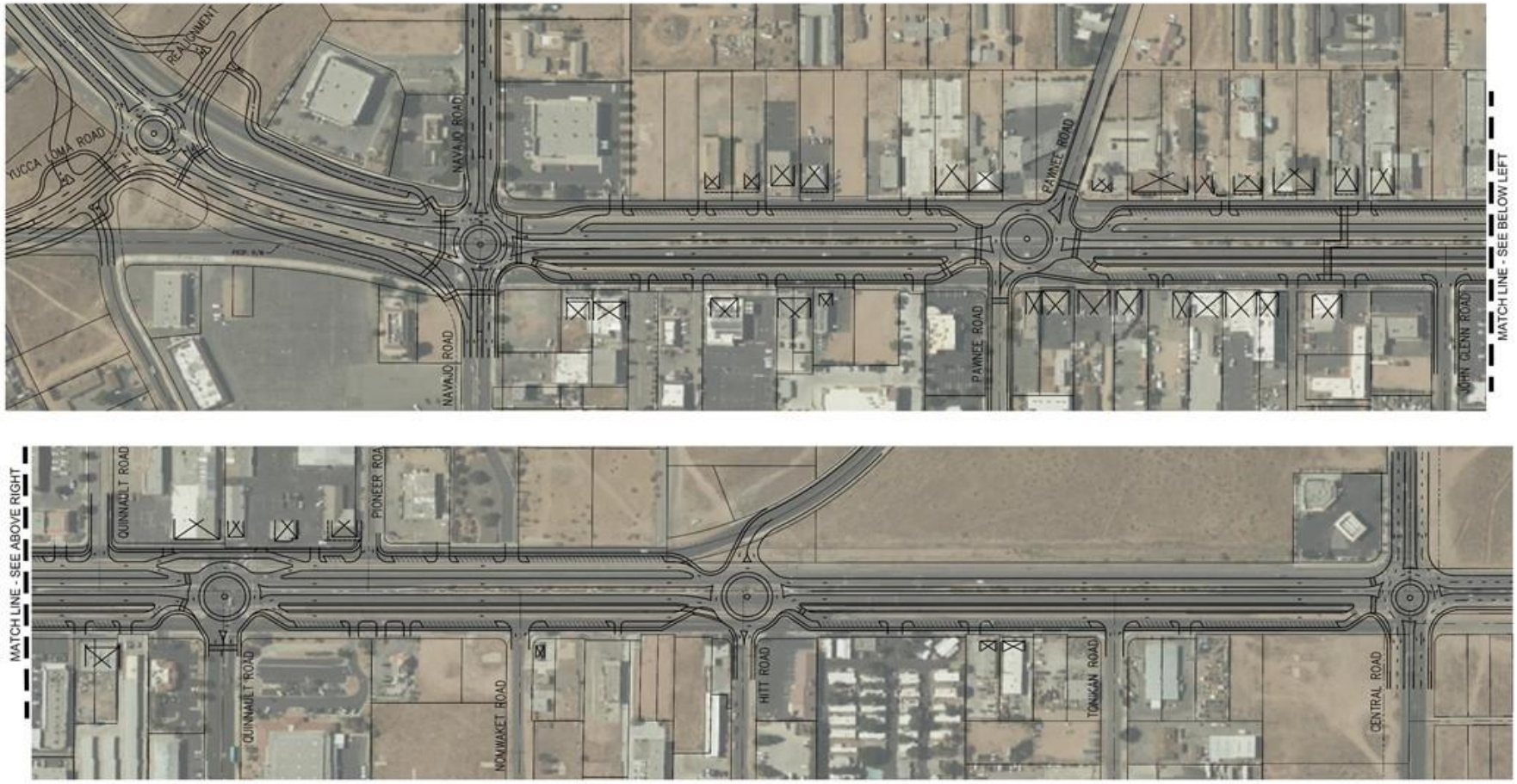
This alternative, shown in **Figure 6**, simplifies complex intersections and reduces conflicts and traffic speeds by converting existing signalized and unsignalized intersections into multi-lane or single lane roundabouts. Multi-lane roundabouts are located at Highway 18 intersections with major thoroughfares including the realigned Yucca Loma Road, Navajo Road, and Central Road. with additional roundabouts added to locations at Pawnee Road and Hitt Road / Headquarters Drive. Between Navajo Road and Central Road, the through lanes are reduced to one in each direction to avoid merging as traffic approaches the single lane roundabouts at Pawnee Road, Quinault Road, and Hitt Road / Headquarters Drive.

The Outer Highway 18 frontage roads remain separated from the central throughway by curbing, landscaping, and bicycle facilities—a change from the proposed configuration in the Corridor Enhancement Plan where the frontage roads were combined with the central throughway separated only by a wide shoulder. For the Specific Plan the frontage roads are widened to provide on-street parking (see typical section below) and kept separated from Highway 18. Another modification is that the frontage roads do not connect to the north south streets as they do today, thus eliminating the complex and inefficient intersections. Access to and from the frontage roads is achieved with ramps that merge or diverge with each roundabout's entry or exit lane. The frontage road access ramps are illustrated in **Figure 6.**

Pedestrian crossings are similar for each roundabout whether multi-lane or single lane. Crosswalks at roundabouts are placed about 20 feet from the roundabout entry or exit point. Crosswalks at roundabouts are multi-stage crossings so pedestrians cross a single lane (or two lanes for multi-lane roundabouts) with traffic traveling in one direction at a time. Between stages pedestrians wait on a wide refuge island. At a typical roundabout there are two stages per street crossing. Some roundabout approaches provide a right turn bypass lane—which is usually an uncontrolled or yield controlled sweeping right turn lane that bypasses the roundabout. Pedestrians must also cross this lane as a separate stage if one exists. An example of a bypass lane is shown in **Figure 6** for the right turn from eastbound Highway 18 to southbound Navajo Road.

Some key benefits of this alternative include:

- Space gained within the existing right of way after implementing a "road diet" on Highway 18 and narrowing the central thoroughfare to one lane in each direction between Navajo Road and Central Road allows for other needed features on Highway 18. The width gained by the lane reduction and reclaiming the space currently occupied by drainage channels can accommodate a significant amount of angled parking on the widened one-way frontage roads as well as providing a multi-use path parallel to Highway 18 on the south side.
- The roundabout alternative simplifies the complex multi-approach intersection of SR 18 / Outer Highway 18 South / Navajo Road / Yucca Loma Road and Highway 18 / Pawnee Road resulting in fewer conflicting movements and likely reduction in collisions.
- The realignment of Yucca Loma Road and new intersections within the Highway 18 corridor improves the north-south connectivity within the core of the Specific Plan area.




Apple Valley Village Specific Plan

**Figure 6**
**Alternative 1 Highway 18 Conceptual Geometric Plan**
(Highway 18 All Roundabouts Alternative)

- Space created by necking down travel lanes approaching the roundabout entries is an opportunity to implement urban design features such as landscape, hardscape, pedestrian plazas, pocket parks, public art, café seating, etc.
- The addition of several new full movement intersections on Highway 18 improves overall circulation and reduces the spacing between pedestrian crossings from an average of about 2,500 feet to an average of about 1,300 feet.

Typical Street Section of Highway 18 in Alternative 1

**Figure 7** illustrates a typical section of Highway 18 between Navajo Road and Central Road under Alternative 1. The existing 212-foot right of way can accommodate two travel lanes with a wide raised median that can support landscaping and street trees. Outside of the 58-foot traveled way on the south side of Highway 18, the 27-foot buffer between the travel lanes and the frontage road provides ample space for 12-foot-wide multi-use path and landscaping. On the north side of Highway 18, the 18-foot-wide buffer can accommodate a one direction bike lane and landscaping. The 34-foot one-way frontage roads can accommodate a 20-foot-wide travel lane and angled parking to serve the land use fronting Highway 18. The remaining width from the 212-foot-wide total right of way is dedicated to the pedestrian realm. The typical section shows 25-feet of sidewalk / parklet on the north side of Highway 18 and 16-feet of sidewalk / parklet on the south side.

2. Alternative 2 - All Traffic Signals on Highway 18

This alternative, shown in **Figure 8**, expands on the existing Highway 18 configuration and adds traffic signal control at key intersections throughout the corridor. Frontage roads are retained but modified as one-way streets with angled parking and elimination of conflicting movements where frontage roads intersect cross streets. Traffic signals are added to the Yucca Loma Road realignment with Highway 18, the Yucca Loma extension to Navajo Road, Highway 18 at Pawnee Road, and at the realigned Headquarters Drive and Hitt Road intersection. These new signals improve the spacing of protected pedestrian crossings but are not spaced too closely for effective signal coordination along the corridor. Highway 18 remains four-lanes with left turn bays at each intersection.

Frontage Roads are converted to one-way and angled parking is provided on one side of the road. Frontage Road intersections with cross streets are eliminated or conflicting movements are restricted. Access to/from the frontage roads and Highway 18 employs ramps prior to or after signalized intersections.

Standard pedestrian crossings are provided on all legs of each intersection. At most locations pedestrians must cross the frontage road to reach a signalized crosswalk across Highway 18. Frontage road crossings are short, single lane crossings with traffic traveling in one direction. Curb extensions adjacent to the angled on-street parking reduce crosswalk width and improve sightlines between pedestrians and motorists.

Benefits of Alternative 2 include:

- New signalized intersections uniformly spaced reduce distance between protected crossings compared to existing conditions. The spacing of traffic signals (approximately 1,300 feet) is ideal for signal coordination.
- The width of the traveled way accommodates four travel lanes and a wide median for left turn lanes and landscaping / street trees. Combined with street trees along the edges of the roadway in parkways, there is an opportunity to create a canopy of trees over the roadway.

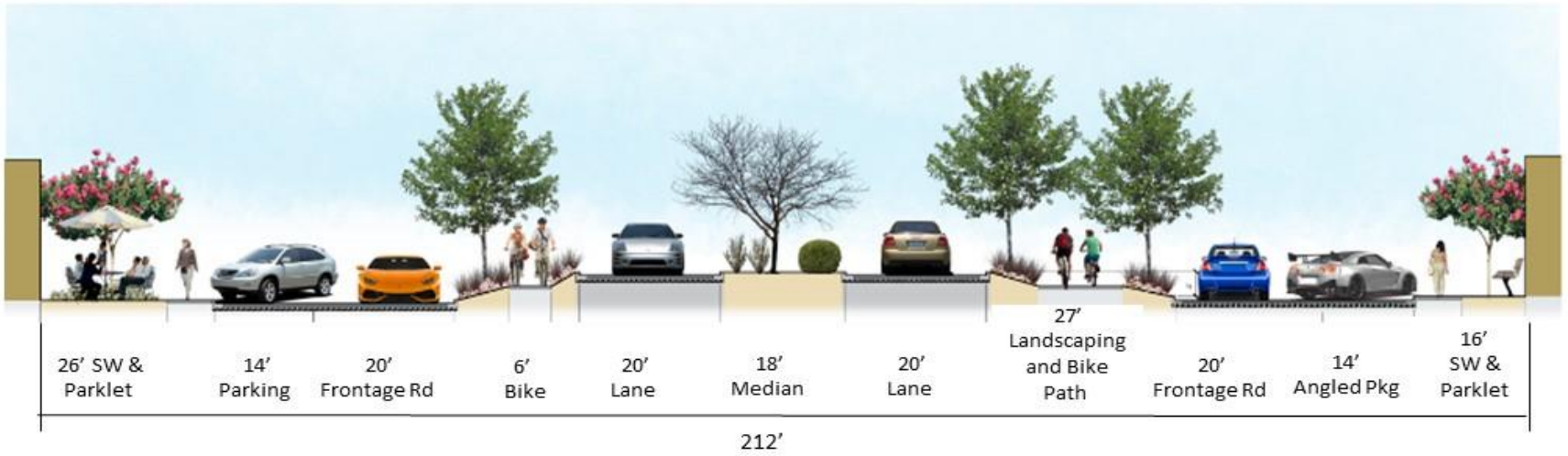



**Figure 7**
**Typical Section of Highway 18 in Alternative 1**
**(All Roundabouts)**


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**Figure 8**
**Alternative 2 Highway 18 Conceptual Geometric Plan**
(Highway 18 All Signals Alternative)

- Reconfiguration of frontage road intersections with cross streets, use of ramps to access Highway 18 and conversion to one-way practically eliminate the inefficient and confusing multi-approach intersection existing today.
- Conversion of the frontage roads to one-way and a single lane leaves space to provide angled parking on one side of the road, a particularly important benefit for the businesses on small lots within the corridor that lack on-site parking.
- The width of Highway 18 allows for buffered Class II bike lanes in each direction or, alternatively, the width could be allocated outside of the traveled way for the provision of a multi-use path parallel to Highway 18 on the south side of the road.

Typical Street Section of Highway 18 in Alternative 2

**Figure 9** illustrates a typical section of Highway 18 between Navajo Road and Central Road under Alternative 2. An 86-foot-wide traveled way within the existing 212-foot total right of way can accommodate four travel lanes, buffered bike lanes in each direction, and a wide raised median that can support landscaping and street trees. Outside of the 86-foot traveled way on the south side of Highway 18, a narrow 13-foot landscape buffer separates the traveled way from the frontage road. This landscape buffer can become a multi-use path by foregoing one or both buffered bike lanes.

The 34-foot one-way frontage roads can accommodate a 20-foot-wide travel lane and angled parking to serve the land use fronting Highway 18. The remaining width of the 212-foot right of way is dedicated to the pedestrian realm. The typical section shows 7-foot-wide sidewalks and a 14-foot or 9-foot wide parklet (space adjacent to buildings where outdoor seating can be provided).

D. Truck Routes and Deliveries

Designated truck routes in the Specific Plan area include through truck routes on Highway 18 and Central Road. These designations will not change since Highway 18 and Central Road are routes of regional significance and serve many areas of the Town and the region. In Alternative 1, the design of the single lane roundabouts must accommodate frequent large trucks without requiring the trucks to use the mountable apron on the center median.

Navajo Road is a designated local truck route and provides access to local streets in the Specific Plan area for the delivery of goods to businesses, particularly those in Districts 1 and 2. With the proposed redesign of the Highway 18 frontage roads it may be challenging to accommodate delivery. Strategically placed curbside loading zones should be considered on the frontage roads and on the north-south local streets close to the concentration of businesses.

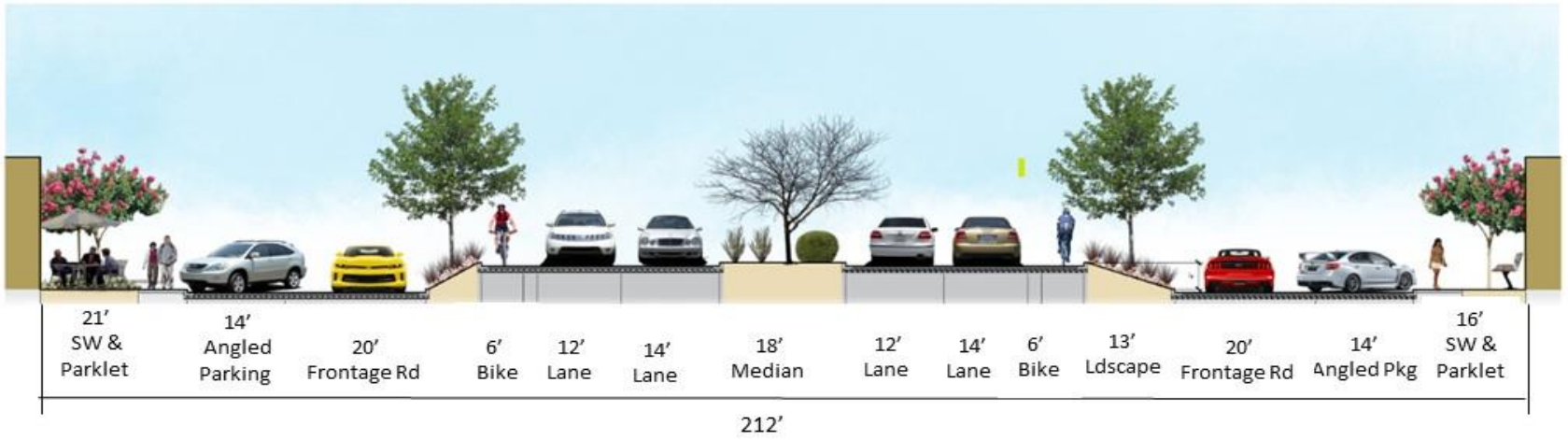



**Figure 9**
**Typical Section of Highway 18 in Alternative 2**
**(All Signals)**

E. Active Transportation Plan – Pedestrian Network

An Active Transportation Plan is incorporated into the Specific Plan's Circulation Plan and is divided into a pedestrian network and a bicycle network. **Figure 10** illustrates the pedestrian network which is comprised of primary pedestrian routes and pedestrian crossings.

1. Primary Pedestrian Routes

Primary pedestrian routes are a network of streets providing access to all parts of the Specific Plan area. Primary pedestrian routes emphasize features that encourage walking including:

- Directness and Connectivity. The grid of linear streets within the Specific Plan area forms a good armature for the pedestrian network because it provides direct, straight paths from block to block. South of Highway 18 (which encompasses much of the mixed-use Districts 1 and 2) the blocks are approximately 600 feet wide by 1,200 feet deep. The spacing of the north-south local streets is not uniform so block widths vary from as little as 300 feet to as much as 1,200 feet for the largest block. In general, these block widths are considered walkable if not close to the limit of a walkable urban block. The 1,200-foot depth of the blocks, however, far exceeds the block length considered optimal for walking. To overcome this, new development should be encouraged to create pass-throughs in the form of alleys or mews and to connect them with adjacent developments to eventually create east-west pass-throughs that connect the north-south local streets.
- Comfort and Safety. Primary pedestrian routes should be perceived as comfortable and safe to attract pedestrians and encourage walking and even exploration of the area. Features that make pedestrians comfortable include trees that provide shade in the summer and protection from the elements in the winter, a buffer or separation from moving traffic on the adjacent street, seating for resting or waiting, enough space to maintain a reasonable separation from other people, and clean and well-maintained facilities. Accessibility is a critical feature of a comfortable and safe street for the disabled and the elderly.

  A safe pedestrian route is one where the pedestrian perceives the route safe from traffic, other people, or crime. Features that make pedestrians feel safe include adequate sight lines to the end of the block or beyond, good illumination of the sidewalk at night, and an absence of blind corners, dark recesses, or dense vegetation.

The features described focus on the design and maintenance of the street. There are many other features of urban places that encourage walking that are related to places and activities, varied building architecture, types of ground floor land uses, etc.

As shown in **Figure 10**, the major thoroughfares in the Specific Plan area are designated primary pedestrian routes because they provide direct access to many of the destinations people want to walk to, including transit stops and protected crossings of major streets. Most of the primary pedestrian routes are on local streets because they connect residential areas to commercial areas and are perceived as more comfortable and safer than major thoroughfares. Further, the primary pedestrian routes are more densely concentrated in District 1 (The Village Core) and the northern portion of District 2 (Village Services South)—areas with the highest expected levels of retail and entertainment activity.


For presentation, this pedestrian network plan portrays the "all roundabouts" alternative at Highway 18 intersections. This plan, however, is equally applicable to the "all signals" alternative in which the roundabouts are replaced with signalized intersections.

Apple Valley Village Specific Plan

**Figure 10**
**Active Transportation Plan – Pedestrian Network**
(Highway 18 All Roundabouts and All Traffic Signals Alternatives)

2. Multi-Use Paths

Multi-use paths are bi-directional off-street paths used by multiple modes including walking, bicycling, and equestrians in certain areas. In California, Class I bikeways, also known as bike paths or shared-use paths, are facilities with exclusive right of way for bicyclists and pedestrians, away from the roadway and with cross flows by vehicular traffic minimized.

The Multi-Use Path or Class I Bicycle Facility designation illustrated in **Figure 10** is considered a shared-use facility and therefore is included in both the pedestrian and bicycle networks. The multi-use paths in the Active Transportation Plan are consistent with the Town's General Plan bikeway plan which designates Class I bikeways on Central Road, Navajo Road, Esaws Avenue, and Yucca Loma Road.

The Circulation Plan includes a multi-use path parallel to Highway 18 between Navajo Road and Central Road as a direct route for pedestrians and bicyclists desiring to travel through the Village with minimal conflicts and crossings.

3. Pedestrian Crossings

Pedestrian crossings are an essential component of the pedestrian network. Crossings of major thoroughfares are the most intimidating aspect of a pedestrian's journey and, if the crossing is long and traffic is fast, it can dissuade the pedestrian from using the route altogether. Factors such as the length of the crossing, the volume and speed of traffic and the lack of intersection safety features at crossings of major streets are primary reasons why people choose not to walk even for short trips.

Highway 18 through the Village is perceived as a significant impediment to walking. Community surveys conducted during the SR 18 Corridor Enhancement Plan revealed that roadway safety concerns were one of the top two priorities of the people who live, own businesses, or visit the Village.

The Circulation Plan emphasizes safe pedestrian crossings and incorporates multiple options for crossing major thoroughfares. The Circulation Plan proposes to triple the number of Highway 18 crossings, effectively reducing the average spacing between controlled crossings from about 2,600 feet to 750 feet. The following describes the types of pedestrian crossing facilities included in the Plan.

- Roundabouts – in Circulation Plan Alternative 1 (All Roundabouts on Highway 18) all the Highway 18 intersections are controlled with multi-lane or single lane roundabouts with enhanced safety features at the pedestrian crosswalks. The advantages of roundabouts from the pedestrian's perspective include:
    - Pedestrians need only cross one direction of traffic at a time at each approach as they traverse roundabouts, requiring crossing of each approach in two stages.
    - Pedestrian–vehicle conflict points are reduced at roundabouts since conflicting vehicles come from fewer directions.
    - The speeds of vehicles entering and exiting a roundabout are reduced, increasing the time available for motorists to react, and reducing potential crash severity should a collision occur.
    - At the multi-lane roundabouts, the crossing of two-lane approaches present a multiple-threat challenge for pedestrians, but the overall lower speeds reduce the likelihood of collisions.
    - As with other crossings requiring acceptance of gaps in traffic, roundabouts present visually impaired pedestrians with unique challenges. Current PROWAG standards, however, suggest

consideration of accessible pedestrian signals for crosswalks at single lane roundabouts and require signals at crosswalks at multi-lane roundabouts.

Pedestrian safety enhancements at roundabout crosswalks include:

- Accessible pedestrian signals at crosswalks on all legs of multi-lane roundabouts as required by PROWAG standards.
- Crosswalks placed at least 25-feet away from roundabout entry/exit for single lane roundabouts and at least 45-feet at multi-lane roundabouts improves driver reaction time.
- Crosswalks marked with zebra or ladder style striping to increase visibility.
- Yield line markings and warning signs in advance of crosswalks increase awareness of crosswalks and indicates to drivers where to stop when a pedestrian is crossing.
- Minimum 10-foot-wide raised pedestrian refuge area on the splitter island separating the roundabout entry and exit lanes.
- Intersection safety lighting illuminating the crosswalks on all approaches.

- Signalized Intersections – in Circulation Plan Alternative 2 (All Signals on Highway 18) all the Highway 18 intersections are controlled with traffic signals providing protected pedestrian crossings. Additionally, Circulation Plan Alternative 1 (All Roundabouts on Highway 18) includes signalized intersections on other major thoroughfares including Navajo Road and Central Road.

  Pedestrian safety enhancements at signalized crosswalks include:

  - Curb extensions, where adjacent to on-street parking lanes, to shorten the crossing distance and increase visibility between drivers and pedestrians waiting to cross.
  - Crosswalks marked with zebra or ladder style striping to increase visibility.
  - Pedestrian countdown timers indicating time left for pedestrian to complete the crossing.
  - Pedestrian refuge islands (with pedestrian pushbutton) in median of long crossings to accommodate slower pedestrians who cannot cross the entire length during the pedestrian crossing signal phase.
  - Stop lines set back at least 10-feet from crosswalk to increase driver visibility of pedestrians in crosswalk and reduce multiple threat type collisions.
  - Intersection safety lighting illuminating the crosswalks on all approaches.

- Pedestrian Overcrossings – Pedestrian overcrossings (or bridges) allow for the uninterrupted flow of pedestrian movement separate from the vehicle traffic. They are usually provided where no other pedestrian facility is available and/or to span a major barrier. Common applications include overcrossings of interstate freeways, active railroad lines, or natural barriers such as rivers.

  Pedestrian overcrossings must accommodate all persons as required by ADA and require ramps or elevators to allow access by the disabled. On standalone overcrossings not connecting the upper floors of buildings on either side of a street (e.g., skyways) extensive ramping is required to accommodate wheelchairs and studies have shown that many pedestrians will not use an overpass if they can cross at street level in about the same amount of time.

  Should pedestrian overcrossings be desired to span Highway 18 within the Specific Plan area, the Circulation Plan has identified two potential locations as shown in **Figure 10**.

- One location would span Highway 18 at the midpoint between Navajo Road and Pawnee Road and connect the north side of Highway 18 to one of the largest blocks in the Village measuring 1,150 feet by 1,255 feet. This block is a potential site for a large development project and/or a public parking facility and a pedestrian overcrossing could be integrated into the site design.
- A second location at the eastern end of the corridor would connect Tonikan Road south of Highway 18 to future development in the large parcel of vacant land south of Headquarters Drive.

- Mid-Block Crossing – mid-block crosswalks are used to connect one side of a street to a pedestrian generating destination on the opposite side of the street. Examples include connecting a major bus stop to a university campus or connecting a parking facility to a stadium. Mid-block crosswalks can also be used to mitigate areas with excessively long distances between crossings.

  Uncontrolled mid-block crosswalks are not recommended on major thoroughfares such as Highway 18. However, if a traffic signal is not warranted an alternative is to install a Rectangular Rapid Flashing Beacon (RRFB) at either a minor intersection or at a mid-block location. These devices are approved for use as pedestrian activated conspicuity enhancements for pedestrian crossing warning signs. The device includes two rectangular-shaped yellow indications, each with an LED-array-based light source, that flash with high frequency when activated. RRFBs are placed on both sides of a crosswalk below the pedestrian crossing sign and above the arrow indication pointing at the crossing. They have been found to be effective in reducing pedestrian crashes.

  The Circulation Plan includes a mid-block crossing of Highway 18 near Del Mar Road, as shown in **Figure 10**, at the approximate midpoint between the crossings located at Navajo Road and Quinault Road spaced over 1,500 feet apart.

4. Public Transportation and Transit Stops

Public transportation can play an important role in reducing greenhouse gas emissions and private vehicle miles traveled. The Specific Plan supports transit's role in improving regional air quality by emphasizing higher density housing and mixed-used development in compact neighborhoods—uses demonstrated to increase demand for transit. The Specific Plan can also support transit by providing an attractive and comprehensive pedestrian network and comfortable bus stops that encourage transit use.

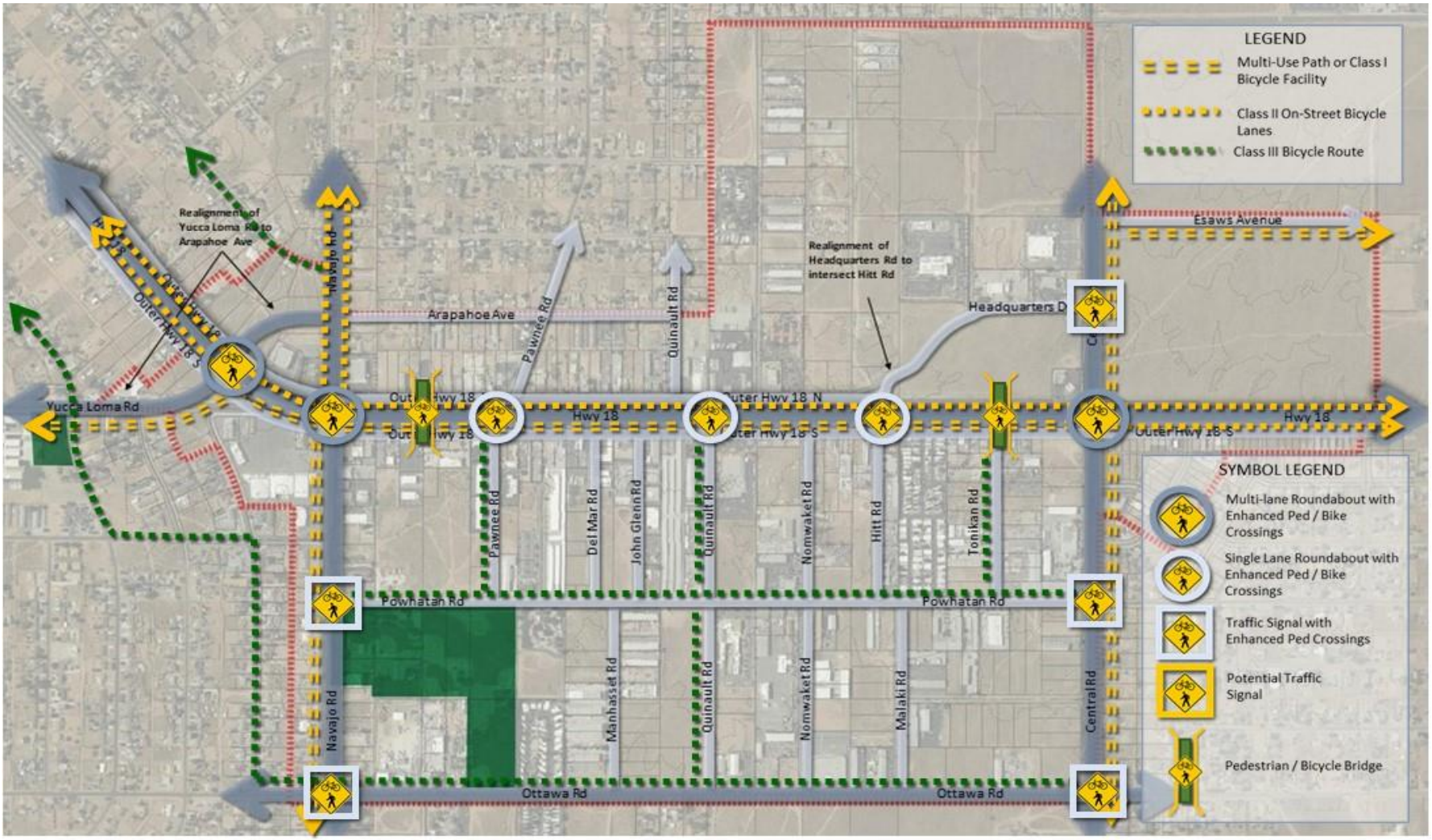
The Victor Valley Transit Authority (VVTA) operates five bus routes serving the Specific Plan area. **Figure 10** identifies four existing concentrations of bus stops where multiple transit routes converge, and transfers occur. The four areas are:

- The intersection of Highway 18 and Navajo Road
- The intersection of Navajo Road and Powhatan Road
- The intersection of Powhatan Road and Central Road, and
- Quinault Road adjacent to the post office

These areas should be focal points for the pedestrian system, streetscape, and urban design.

F. Active Transportation Plan – Bicycle Network

The second key element of the Active Transportation Plan is the bicycle network. **Figure 10** illustrates the bicycle network which is comprised of different classes of bicycle facilities and intersections where bicycle travel is most challenging. This section describes the different types of bicycle facilities in the Plan and the streets most applicable for each facility type followed by intersection features and best practices to improve bicyclist safety.




For presentation, this bicycle network plan portrays the "all roundabouts" alternative at Highway 18 intersections. This plan, however, is equally applicable to the "all signals" alternative in which the roundabouts are replaced with signalized intersections.

Apple Valley Village Specific Plan

DAVID EVANS AND ASSOCIATES INC.

**Figure 11**
**Active Transportation Plan – Bicycle Network**
(Highway 18 All Roundabouts and All Traffic Signals Alternatives)

1. Consistency with General Plan

The bicycle element of the Active Transportation Plan is consistent with and expands upon the bikeway designations in the General Plan. The two types of bicycle facilities serving the Specific Plan area per the General Plan are:

- Class I off-street bicycle or multi-use paths on Yucca Loma Road, Navajo Road south of Highway 18, and Central Road.
- Class II bike lanes on Highway 18 east of Navajo Road, and Navajo Road north of Highway 18.

2. Bikeway Facility Types Proposed for the Specific Plan Area

The bicycle network proposed for the Specific Plan area employs the three conventional classes of bicycle facilities: Class I off-street multi-use path, Class II on-street marked bike lanes (and its variation – buffered bike lanes), and Class III signed bicycle routes / shared-use streets. **Table 2** provides a description of each facility type used in the Bicycle Plan except for the Class IV Separated Bikeways which was not employed in the Plan.

Table 3: Bicycle Facility Descriptions

| | **Class I Bike Paths** | **Class II Bike Lane or Buffered Bike Lanes** | **Class III Bike Routes** | **Class IV Separated Bikeways** |
|---|---|---|---|---|
| **Description** | A completely separated facility for the exclusive use of bicycles and pedestrians with crossflow by motor vehicles minimized. These facilities offer recreation or high-speed commute routes when motor vehicle and pedestrian conflicts are minimized. Typically provided along rivers, ocean fronts, canals, parks, etc. | Provides a striped lane for one-way bike travel on a street or highway. Buffered bike lanes are separated by a marked buffer between the bike lane and the traffic lane or parking lane. | Provides for shared use with pedestrian or motor vehicle traffic either to: (1) provide continuity to other bicycle facilities (typically Class II); or (2) designate preferred routes through high demand corridors. Established with bike route signs and shared roadway markings along the route. | Provides for exclusive use of bicycles (cannot be used by pedestrians or vehicular traffic) and includes a horizontal and vertical separation (e.g., flexible posts, on-street parking, grade separation) required between the separated bikeway and through vehicular traffic. |
| Source: Adapted from "Bikeway Facility Selection Guidance". Memorandum to Deputy District Directors, Design. Caltrans. June 2020. | | | | |

3. Specific Plan Area Bicycle Network

Consistent with the Town's General Plan bikeways on the major thoroughfares employ multi-use paths to separate bicyclists and pedestrians from higher speed, higher volume traffic. These thoroughfares include Navajo Road south of Highway 18, Central Road, and Yucca Loma Road, as shown in **Figure 11**. The exception is the multi-use path along Highway 18 from Yucca Loma Road to Central Road.

Class II bike lanes are provided on Navajo Road north of Highway 18 and the westbound direction of Highway 18 through the Specific Plan area. Class II bike lanes continue in both directions of Highway 18 west of Yucca Loma Road and east of Central Road.

Class III bike routes are provided on local streets to accommodate less experienced bicyclists including Powhatan Road, Ottawa Road, Pawnee Road, Quinault Road, and Tonikan Road. The Ottawa Road Class III route extends west outside of the Specific Plan area to connect with the General Plan designated Class III route on Rancherias Road. North of Highway 18 a Class III route begins at Navajo Road and extends west on Pine Ridge Avenue.

4. Bicycle Crossings of Major Thoroughfares

Bicyclists changing direction do so at intersections and frequently at major thoroughfare intersections. A change in direction may mean a change in facility type, which can be a challenging transition. The design of Class II bike lanes as they approach intersections is well established by the standards in the Caltrans Highway Design Manual and the Manual on Uniform Traffic Control Devices (MUTCD). Further, there have been several advances in bike lane safety using colored pavement markings to delineate space for bicyclists and warn bicyclists and motorists of conflict areas.

Bi-directional multi-use paths require different treatments where they cross streets. Because multi-use paths are commonly separated from the adjacent roadway, they will have a separate crossing some distance from the intersection. Where multi-use paths are aligned to cross at an intersection, the path will align with the crosswalk and special markings are used to delineate the bicycle crossing separate from the pedestrian crossing.