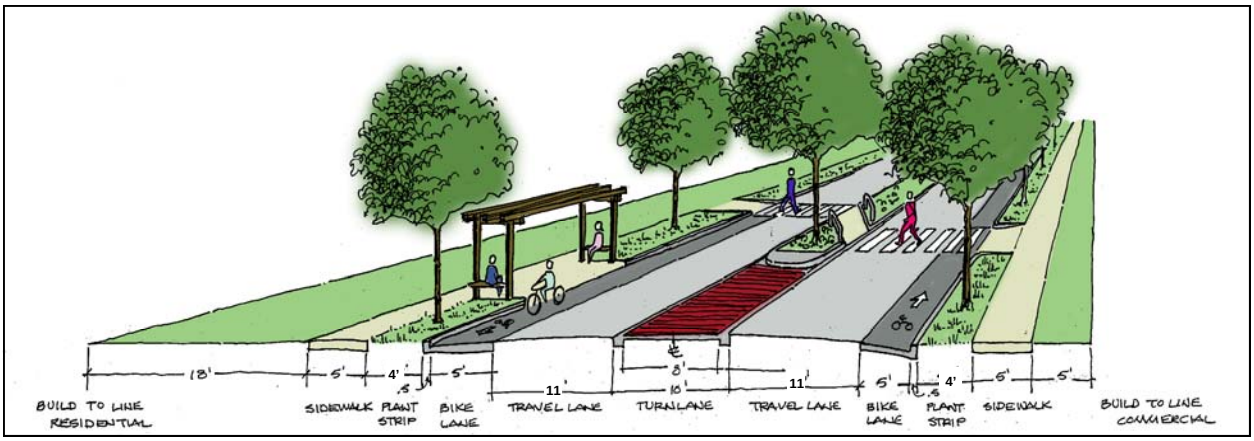
The sections that follow — on recommendations and implementation — provide a range of ideas for improving the conditions along Nord Avenue. Recommendations describe changes that should be made to the street environment to create a "complete street" that works for all users. The section on implementation describes how the recommendations can be built in the short, medium and long term. The specific techniques and treatments that are recommended are explained in greater detail in the sections on "Complete Streets" and "Livable Streets." In order to fully understand how the recommended treatments will work to create a safer, more efficient, convenient and welcoming Nord Avenue corridor it is essential that readers review those sections of the report as well.

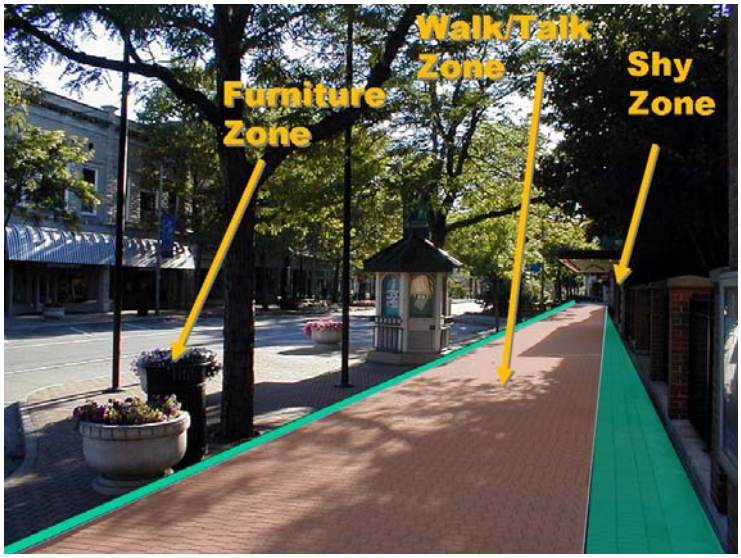
Recommendations



Recommendation:
#1 Make Nord Ave. complete.

A corridor design and plan should be developed to make Nord Avenue a "complete street" over time. New sections should be built or rebuilt (as shown above) to include:

1. **Sidewalks, planting strips and transit shelters.** Sidewalks should be a minimum of 5 feet (and wider along commercial or school areas) and separated from the curb by a 4-foot landscape strip or "furniture zone" buffer. Planting strips provide for greenery and a tree canopy to provide shade and slow vehicle speeds. In commercial areas trees can be accommodated in the 5-foot furniture zone (along with hydrants, signs, trash receptacles, etc.) and inset parking should also be provided. Transit shelters should be provided as needed.
2. **High-visibility crosswalks.** All pedestrian crosswalks should be marked with high-visibility perpendicular markings in order to insure that they are clearly visible to the motorist. Proper signage as specified in the Manual on Uniform Traffic Control Devices should be used to indicate to the motorist where pedestrian crossings are located.
3. **Universal Design.** Complete Streets are designed to accommodate all users including individuals with disabilities. Sidewalks, crosswalks and transit stops must be designed to meet ADA guidelines. One key design feature that many



Complete Streets include well-designed sidewalks that include the three zones shown above. In non-commercial areas the furniture zone, which provides a buffer to pedestrians, can be built as a continuous landscape strip to accommodate trees, hydrants and signs.

Complete streets include high-visibility crosswalk markings such as these on Santa Monica Boulevard in West Hollywood. Some cities use a lower maintenance "piano keys" design that spaces the lines so that vehicle wheels straddle them.

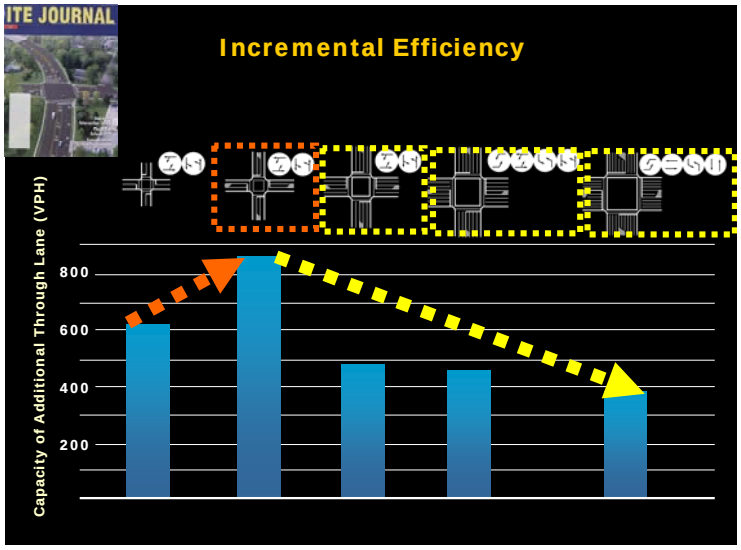
cities still omit is provision of two curb ramps at each corner.

4. **Bicycle Lanes.** Well-marked bicycle lanes (minimum 5') are useful not only for bicyclists but to slow vehicles and provide space for turning movements. The bicycle lanes can also be colorized to reduce encroachment by motorists and to create the illusion of a narrower lane which can help calm traffic.
5. **Third Lane/Turning Pockets.** A third lane or two-way-left-turn lane can improve efficiency by getting turning vehicles out of the through lanes. Turning pockets at intersections also help improve roadway capacity. To keep the third lane from creating the sense of a wide, fast street it can be colorized and/or textured to create the illusion of a narrower street.
6. **Crossing Islands and Medians.** Well placed crossing islands not only create more predictable pedestrian and bicycle crossings, they also prevent motorists from using 3rd lanes for illegally passing other vehicles. Over time, as access management improves, crossing islands can be converted to medians.

Note: It should be possible to accommodate the changes described above within the prevailing 60-foot right-of-way on Nord Avenue. To accommodate wider bicycle lanes, planting strips or bus pull-outs will require purchase of additional right-of-way.

What are "Complete Streets"?
The concept of "complete streets" has emerged in the last few years to focus attention on the fact that streets need to be designed for all users including pedestrians, bicyclists and transit users. The National Complete the Streets Coalition describes this effort as follows: "Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities are able to safely move along and across a complete street." For more information see Chapter 4 (page 43) or visit www.completestreets.org.

Provision of two ramps per corner allows a person in a wheelchair to enter the street safely and insures that a visually disabled person is guided to cross in the right direction.



The Institute of Transportation Engineers Journal in 2001 published an article that highlights the added efficiency of a third lane as shown in the graph above. The third lane can be textured or colorized to create the feel of a narrower street.

Recommendations

Recommendation:

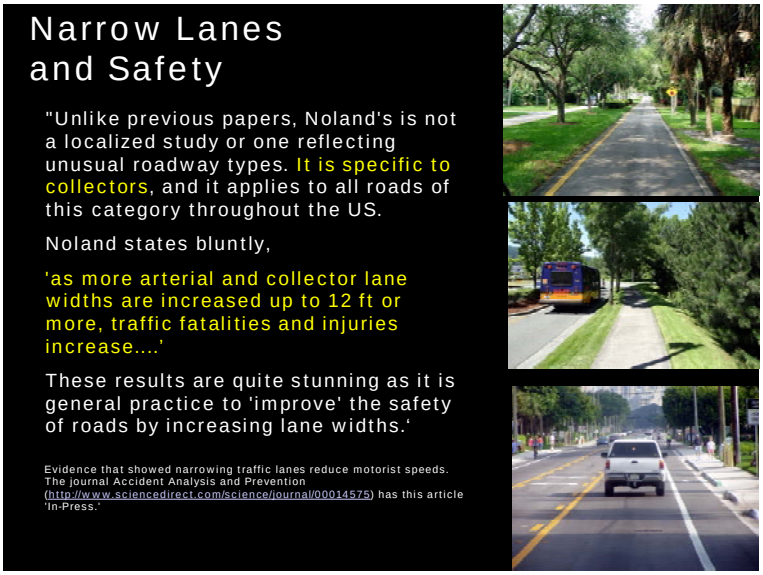
#2 Provide traffic calming along the length of the corridor compatible with retail uses, walking, bicycling and transit.

Nord Avenue should be designed to move traffic efficiently and uniformly at speeds compatible with retail, transit, bicycling and walking. In areas with high concentrations of stores, restaurants, mixed uses and apartments the speed should be in the 25 mph range. Four methods used to keep speeds low, but allow for efficient and uniform traffic movement, include:

1. **Use of narrow lane widths** that increase vigilance and a focus on appropriate speed. There is growing evidence that motorists drive 3-7 mph slower when lane widths are reduced to ten feet (versus 11 or 12 feet). Bike lanes provide the necessary operating space along the road.
2. **Medians or Crossing Islands** can help reduce speeds by visually narrowing the street. They also help pedestrians cross the street safely.
3. **Colorization.** Use of colorized bike lanes and two-way-left-turn-lanes create the illusion of a narrower street and make motorists more alert and aware of their operating space.
4. **Trees.** Use of vertical streetscape features, especially trees and pedestrian scale lamps. Motorists tend to drive at reduced speeds under green canopies and when they can perceive nearby vertical features.

Support:

Noland's research on narrow lanes contributing to traffic safety (see above) further supports these techniques.



"Traffic Calming is the combination of mainly physical measures that reduce the negative impacts of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users." — *Institute of Transportation Engineers*

"An Important tenet of public participation is that communities understand what traffic calming tools are available, and have input in determining which traffic calming features are considered. Traffic calming measures discussed throughout this booklet can be used to enhance livability of community main streets on state highways." — *Main Streets: Flexibility in Design and Operations*

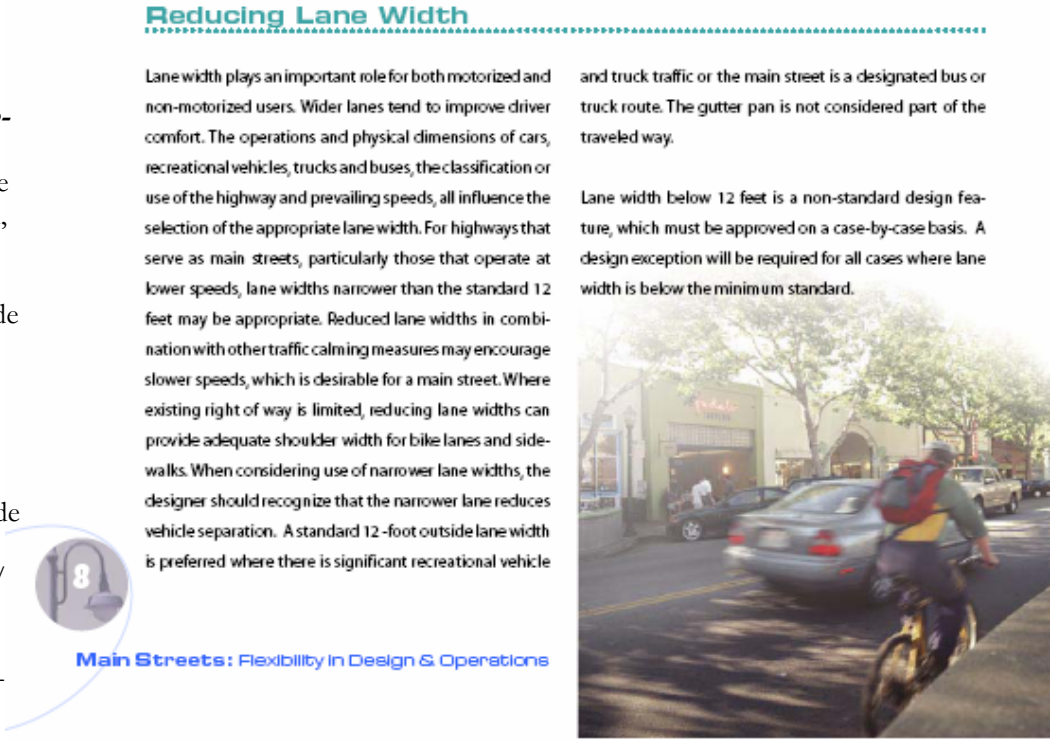
Colorized bike lanes create a visual narrowing of the street.


State Street, Santa Barbara, CA


State Street, Santa Barbara, CA

Support for Narrow Lanes. Caltrans *Main Street: Flexibility in Design and Operations* uses Santa Barbara's State Street (above) as an example of Main Street flexibility and context sensitive design. State Street currently has 10 foot travel lanes. Lanes were narrowed from 11 feet to 10 feet in recent years to create greater safety and operational support. There is added justification for narrow lanes when used with bike lanes and center turn lanes since motorists still have up to fifteen feet of actual space when making turns.

Support: Caltrans' ***"Main Street Guide: Flexibility in Design and Operations"*** includes supportive language. Indeed, photos used throughout the document provide illustrations of narrowed lanes, use of colorization, bike lanes and other techniques. The Guide is available at: www.dot.ca.gov/hq/oppd/context/main-streets-flexibility-in-design.pdf.



Reducing Lane Width

Lane width plays an important role for both motorized and non-motorized users. Wider lanes tend to improve driver comfort. The operations and physical dimensions of cars, recreational vehicles, trucks and buses, the classification or use of the highway and prevailing speeds, all influence the selection of the appropriate lane width. For highways that serve as main streets, particularly those that operate at lower speeds, lane widths narrower than the standard 12 feet may be appropriate. Reduced lane widths in combination with other traffic calming measures may encourage slower speeds, which is desirable for a main street. Where existing right of way is limited, reducing lane widths can provide adequate shoulder width for bike lanes and sidewalks. When considering use of narrower lane widths, the designer should recognize that the narrower lane reduces vehicle separation. A standard 12-foot outside lane width is preferred where there is significant recreational vehicle and truck traffic or the main street is a designated bus or truck route. The gutter pan is not considered part of the traveled way.

Lane width below 12 feet is a non-standard design feature, which must be approved on a case-by-case basis. A design exception will be required for all cases where lane width is below the minimum standard.

8

Main Streets: Flexibility in Design & Operations

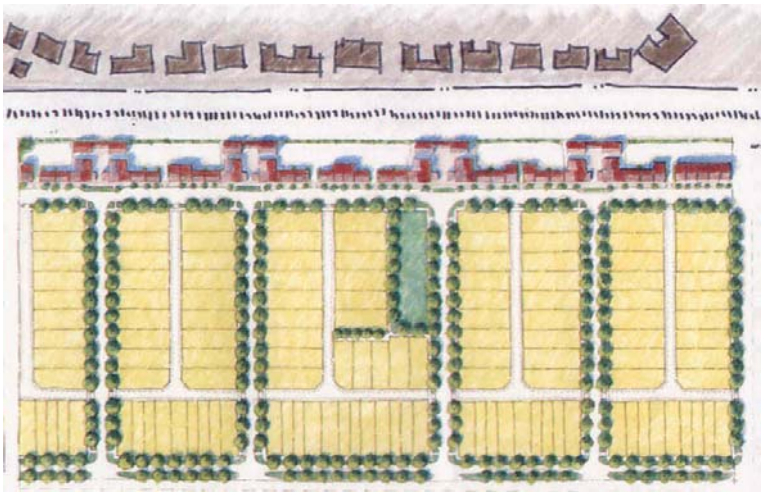
Recommendations

Recommendation:
#3 Expand street network.

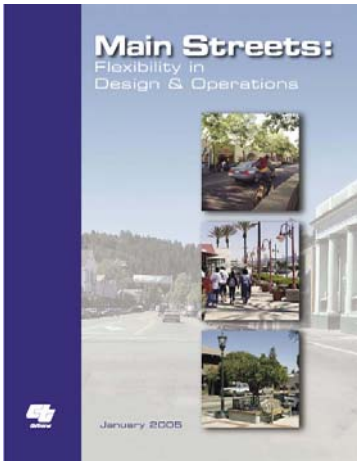
As noted early in this report, one of the major challenges of managing traffic in the corridor is that the "effective road network" is very limited and funnels significant traffic onto Nord Avenue. As a result, Nord Avenue is carrying significant local traffic instead of functioning as a regional arterial. Over time, new roads should be built, especially around key mixed use village areas (W. Sacramento and W. 8th Ave.). The new Westside Neighborhood that is under construction along Nord Avenue demonstrates how that can be done by including well-connected streets and a roadway that parallels the railroad tracks.:

1. **Expanded Network.** As shown in the map above, several streets will be put to better use with new street connections. A connector street just northeast of Emma Wilson Street will make it possible for residents to the west and south to get to W. 8th Avenue without using Nord Avenue. The small connector across Lindo Channel will also provide additional access.
2. **Traffic distribution.** New connectivity will handle turns more efficiently, by taking some of the pressure off of the key W. Sacramento and Nord Avenue congestion point.
3. **New streets.** Interior circulation of traffic through areas of dense apartment use will better distribute vehicles, pedestrians and bicycles.

Diagram of suggested additional street Network that can be built out



Westside Neighborhood plan shows a well-connected street system. The street that runs parallel to the railroad tracks on the northeast should be emulated in future development along Nord Avenue.

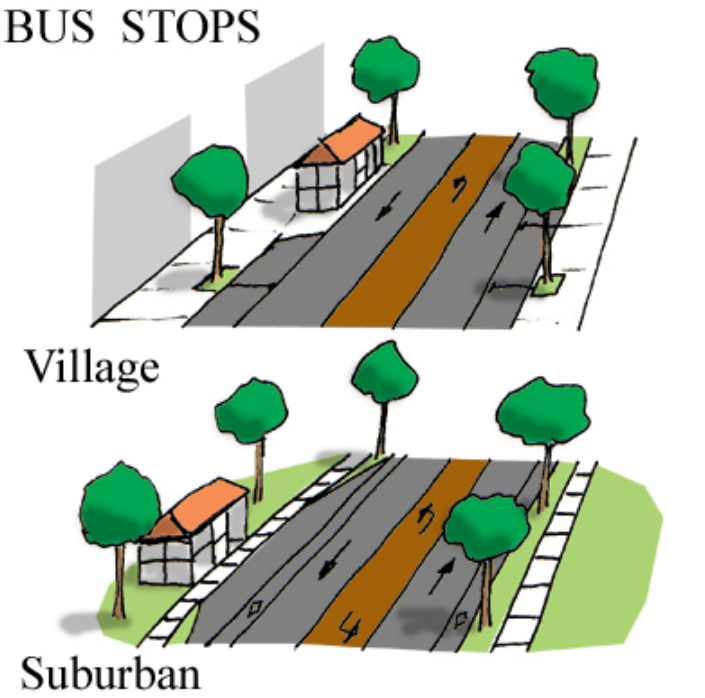


Recommendation:

#4 Provide attractive and functional transit shelters/stops according to speed and location .

Nord Avenue should provide high levels of support for transit by including attractive, well-maintained and functional bus stops:

1. **Urban or village areas.** Most of Nord Avenue should include transit shelters appropriate for urban or village areas as shown to the right. The transit vehicle picks up and drops off passengers in the bicycle lane. This works well when transit headways are 10 minutes or more, and bicycling volumes are moderate.
2. **Suburban.** If speeds are higher along sections of the corridor a more suburban design is appropriate with pull-out space for transit vehicles. While this approach was favored by workshop participants along the entire corridor, in most locations with transit stops there is not enough space to accommodate pull-outs. One option would be to work with property owners along Nord Avenue to secure easements to accommodate these types of transit stops. In communities with high volumes of traffic and aggressive drivers, this design can create problems since vehicles that pull-out to drop or pick up passengers find it difficult to merge back into the traffic lane. Before implementing this type of transit stop, the City and transit agency should determine whether this will be a problem. The stop should be well designed with a distinctive, attractive shelter. Ideally it should be located in the furniture zone of the sidewalk and clear of the walk/talk zone.

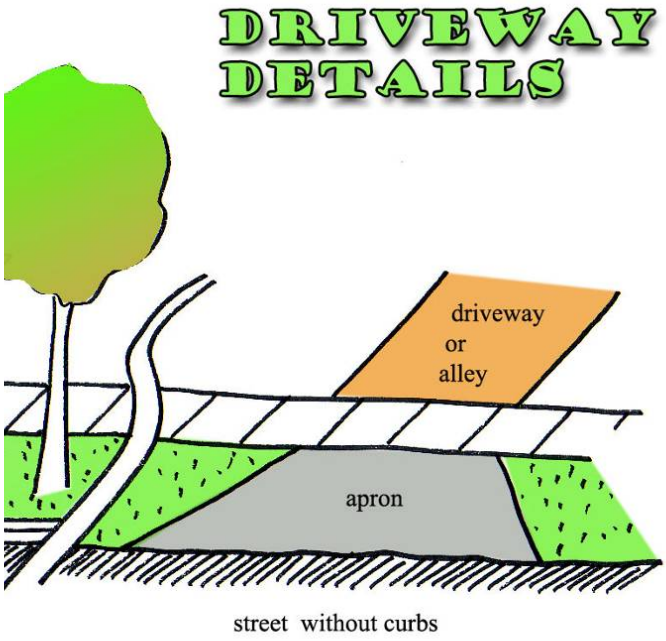


Recommendation:

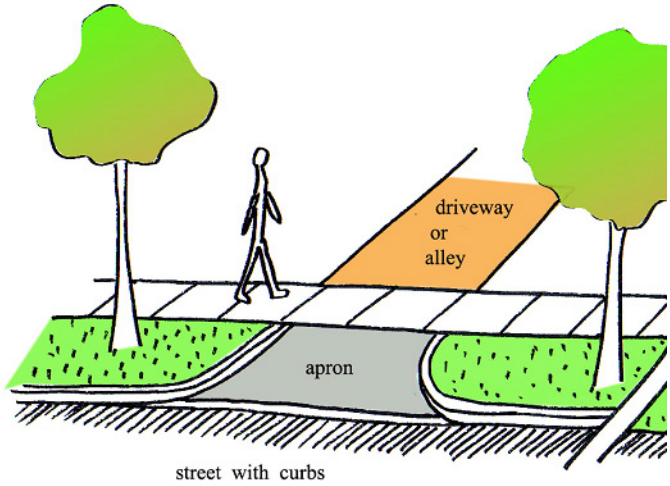
#5 Provide a distinct treatment to residential and commercial driveways, alleys, and other crossings.

Nord Avenue should require future residential and commercial driveways to be designed with a 5-foot minimum landscape strip adjacent to the curb. This makes it possible to provide an even and continuous sidewalk with no more than a 2% cross slope and to put driveways outside of the pedestrian's path of travel. With this design the change in grade can be accommodated in the landscape strip as shown in these illustrations.

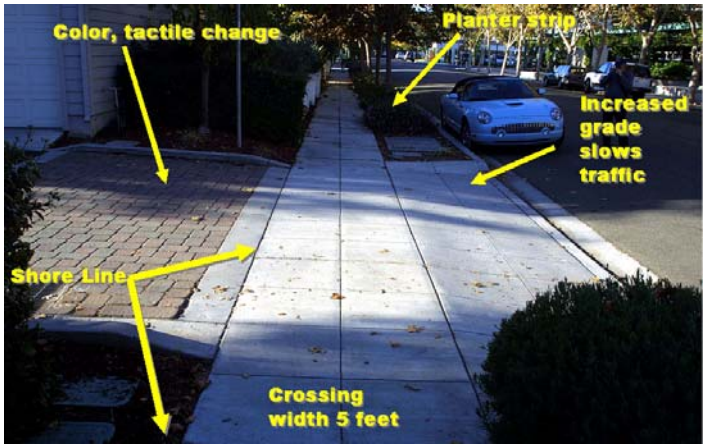
1. **Grade transitions.** Grade transitions should be taken up in the apron. This will have a slowing and calming effect before motorists cross the sidewalk and interact with pedestrians.
2. **Consolidate driveways.** There are numerous driveways along Nord Avenue that increase vehicle conflicts and create obstacles for pedestrians. Over time the City should work with property owners to consolidate driveways and improve access management.
3. **Sidewalk.** Sidewalks should be smooth and continuous across the driveway to comply with ADA guidelines. Sidewalks should be thickened to six inches (or more) to support structural load of vehicles
4. **Driveway.** A distinctive 6-12" color band next to the sidewalk, should be included to create a "shore line" to guide older adults and people with visual disabilities through the exposure area.
5. **Innovative Parking Strategies.** Over time the City should work with property owners to implement strategies that make more efficient use of parking including shared parking, meters, increased bicycle parking and residential transit pass systems.



Rural Driveway Treatment



Urban Driveway Treatment



Recommendations

Proposed set of roundabouts at the intersection of Nord Avenue and West Sacramento.

Recommendation:

#6 Provide roundabouts at key intersections in the corridor to improve traffic flow at desirable speeds.

In the longer term, once efforts to make Nord Avenue a "complete street" have been implemented, key intersections should be converted to roundabouts to maximize safety, efficiency, traffic volume and to support walking, bicycling and transit. Roundabouts are proving to be superior to signal controls for high volume, near capacity, intersections for the following reasons:

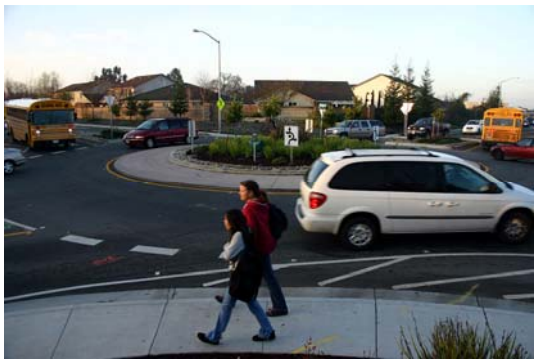
1. **Handle up to 30% more traffic with less delay.** Roundabouts are capable of moving more vehicle traffic with no delay most hours of the day, and with less delay during peak hours.
2. **Safety.** Roundabouts have proven to reduce personal injury crashes 80-90% (compared with signal or stop sign controlled).
3. **Pedestrian and bicycle friendly.** Roundabouts reduce pedestrian and bicycle delay, reduce crashes and crash severity, reduce crossing distances, and create a sense of place.
4. **Roundabouts control corridor speed.** Signals tend to speed motorists up as they approach intersections, while roundabouts uniformly reduce speed to 15-20 mph at these critical locations.

Caltrans Main Street Guide, Benefits of Roundabouts

- **Reduce speeds of vehicles**
- **Improve access and traffic circulation**
- **Reduce delay**
- **Reduce the number of through and channelization lanes**
- **Provide more space for bicycle and pedestrian facilities**
- **Improve pedestrian mobility**
- **Reduce fuel and/or energy consumption**
- **Lower vehicle emissions**
- **Provide unique opportunities for landscaping and other aesthetic treatments**
- **Have the unique ability to serve as a physical and operational interface or gateway between rural and urban areas where speed limits change**

Support:

Caltrans ***"Main Street Guide: Flexibility in Design and Operations"*** includes supportive language on roundabouts. Other supportive language comes from the Federal Highway Administration and the Insurance Institute for Highway Safety.

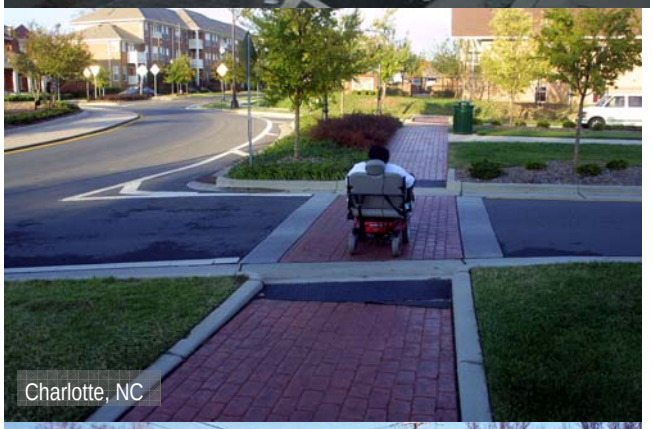


A single lane roundabout at Orchard Lane and W. River Drive near a middle school in Sacramento has improved traffic flow while providing a safe location for students to cross.

Pedestrians and Bicyclists at Roundabouts

Roundabouts are still fairly new in the U.S. and many communities express concern when they are first proposed. However, once they are built residents often embrace them and recognize that they are safer, quieter, more attractive and more efficient than typical signalized intersections. While traffic engineers often recommend roundabouts because they are more efficient than a typical stop-controlled intersection, the lower speeds and more predictable vehicular movement also make them very safe for pedestrians and bicyclists. Following are some key factors to consider:

- A typical 4-way intersection has 24 vehicle-to-pedestrian conflicts. At a roundabout these conflicts are reduced to 8.
- Properly designed roundabouts in urban areas are designed to bring vehicle speeds down to 15-25 mph, speeds at which motorists are much more likely to yield to pedestrians. (Concern that the smoothing out of traffic flows at a roundabout will make it difficult for pedestrians to find a gap to cross has not been found to be the case. For example, a large, two-lane roundabout in Clearwater, FL handles over 6,000 pedestrians during peak summer season without any problems.)
- The splitter island in a roundabout provides a refuge for pedestrians as they cross the street and simplifies the crossing by letting them focus on vehicles traveling in only one direction. (Pedestrian safety studies have shown that crossing one lane of traffic is very safe.)
- Because roundabouts are more efficient at moving traffic it is often possible to use a one-lane roundabout instead of widening an intersection to four or more lanes. A 4-lane intersection might require a pedestrian to cross over 50 feet. A one-lane roundabout breaks the crossing into two 12-14 foot legs.
- Roundabouts also work well for bicyclists. Most bicyclists at roundabouts simply take the travel lane since vehicles are circulating at a comfortable bicycle speed. Less confident bicyclists can be provided with a ramp on the approach to the roundabout so they can exit and walk their bicycle across at the crosswalk. (In areas with high bicycle use the sidewalk and crosswalk areas should be wide enough to avoid creating conflicts between bicyclists and pedestrians.)



Well-designed roundabouts can accommodate pedestrians, bicyclists and other users in a safe, comfortable way.

Implementation

Improvements to the public space on Nord Avenue will be implemented over time. In this chapter specific projects are identified that can be developed by the public sector to stimulate private sector investment in the corridor, correct infrastructure deficiencies, and enhance the quality of the corridor's parks, road network, and public plazas. Projects are broken out into Short Term, Mid-Term and Long Term.

Implementation

Short Term

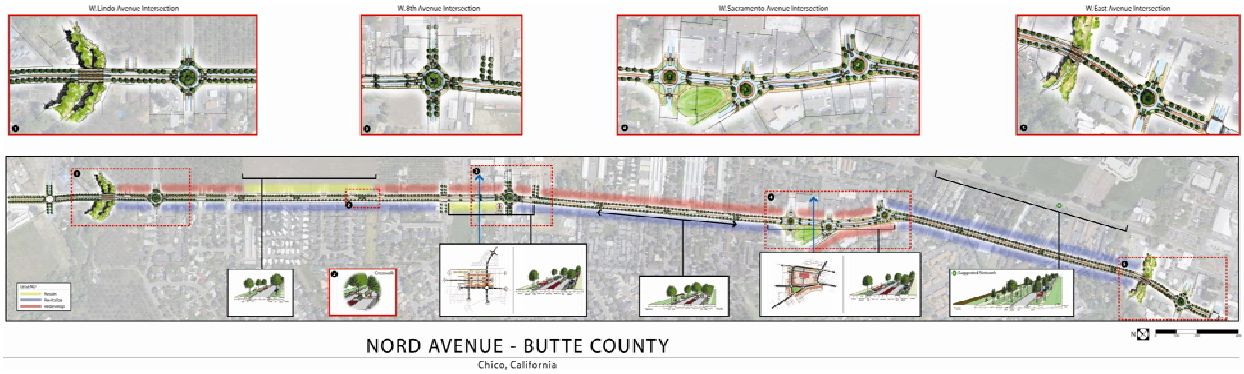
- Complete the street by building or retrofitting Nord Avenue to include:
  - Detached sidewalks with planter strips in residential areas/furniture zones in commercial areas
  - Well-marked bicycle lanes (preferably colorized)
  - Transit shelters
  - Well-marked, high visibility crosswalks
  - Universal design including two curb ramps per corner
- Colorized and/or textured center lane
- Mid-block center islands/crossings and medians with turning pockets where appropriate
- Well-marked bicycle lanes (preferably colorized)
- Complete sidewalk along W. 8th Avenue on southeast side of street approaching Emma Wilson Elementary School

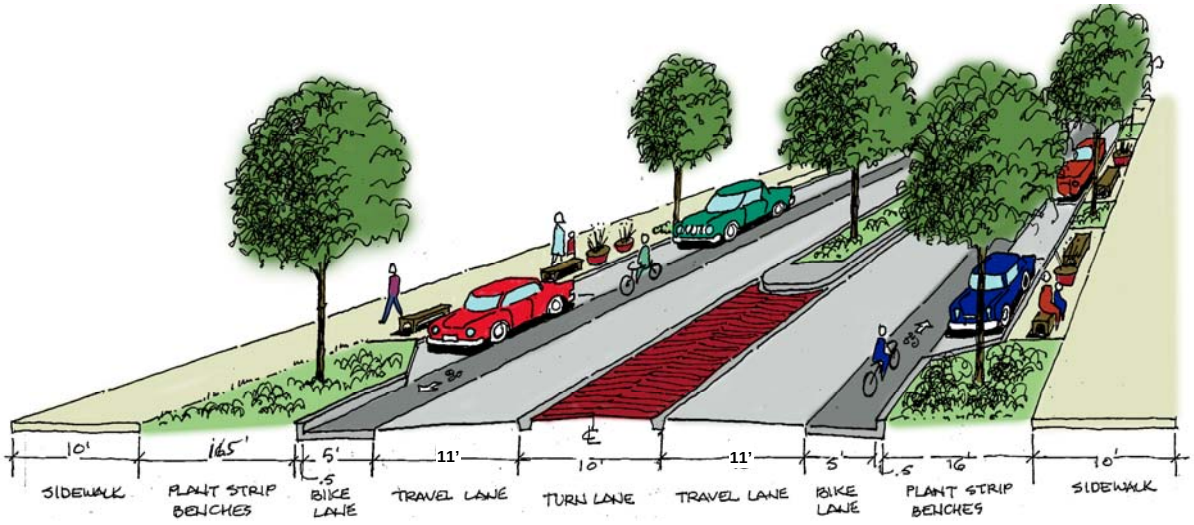
Mid Term

- Roundabouts at the intersections of Nord Avenue and W. First Street, W. Sacramento Avenue, W. 8th Avenue, and W. Lindo Avenue
- Big Chico Creek Bridge enhancement and trail

Long Term

- Connector street to Emma Wilson Elementary School
- West Sacramento mixed use village (southwest and northeast plaza)
- W 8th Ave. mixed use village (northwest and northeast sites)
- Expand street network





In the short-term the street section near W. Sacramento could be reconfigured with a median and bicycle lanes. In the longer term inset parking and a wider sidewalk could be provided by acquiring approximately 20-feet of additional right-of-way.

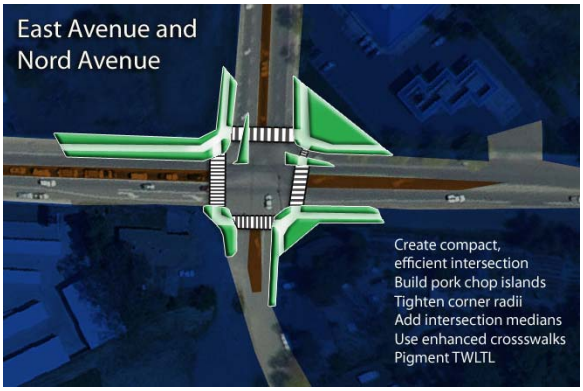
Short Term Projects

As noted in Recommendation #1, emphasis in the short-term should be placed on converting Nord Avenue into a "complete street" with sidewalks, crosswalks, landscaping, bicycle lanes and transit shelters. A corridor plan should be prepared that lays out how these changes will be made over time. Priority should be given to the areas with the highest volumes of motor vehicles, pedestrians and bicyclists and a large number of trip generators including schools, retail and housing. Some changes can be implemented in the short term at relatively low cost . They include:

- installing well-marked and signed bicycle lanes the length of the corridor
- marking high-visibility crosswalks at intersections and midblock locations
- installing crossing islands, especially in the segment of Nord Avenue from W. Sacramento to the Big Chico Creek Bridge (and at the midblock crossing near Stewart Avenue)

Priority should also be given to building first-class commercial sidewalks on both sides of Nord Avenue in the West Sacramento area. That effort will require working with business to consolidate driveways, extend the right-of-way and, over time, to find ways to move stores closer to the sidewalk with parking in back.

Sidewalks, curb and gutters along less-developed



This diagram shows how as sidewalks and crosswalks are built special attention should be placed on providing curb extensions and crossing islands at large intersections so as to moderate speeds and help pedestrians cross the street.

This rebuilt street in University Place, WA demonstrates some of the features of a complete street: An ample and well-marked bicycle lane, a planter strip and a 5-foot sidewalk. The travel lane is 10 feet wide, the bicycle lane is 6 feet.

sections of Nord Avenue near Lindo Avenue will take longer but should be part of any new development that takes place in that area.

The reconstruction of Nord Avenue should take into consideration and respond to the potential for redevelopment along the corridor. For example, the potential for mixed use redevelopment at W. Sacramento and W. 8th Avenues would benefit from the inclusion of on-street parking along Nord Avenue. If the street is reconfigured before the redevelopment of adjacent parcels, on-street parking should be included. There are some important considerations related to on-street parking both on Nord Avenue as well as on adjacent streets:

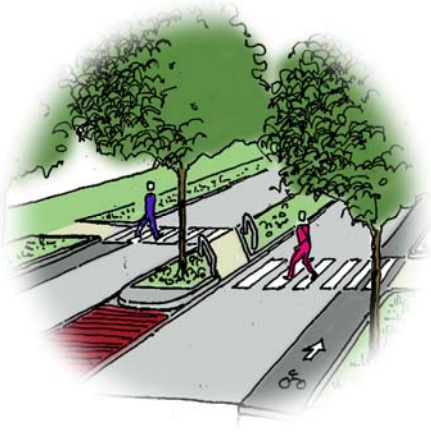
1. Use curb extensions to allow for inset parking and to minimize pedestrian crossing widths.
2. Use tree wells for added plantings and to continue narrow street character.
3. Parking and bike lanes can be used in combination as long as sufficient space is devoted to operations and safety. In general bike lanes next to parallel parking should be 7 feet wide, while parking bays are 6 feet wide.

At the western end of the corridor, the intersection at West East Avenue can be enhanced by narrowing down the lanes to 10-feet, tightening the corner radii, adding intersection medians and pork-chop islands, using high-visibility crosswalks and colorizing the turning lanes (see diagram on next page). This will help create a gateway for motorists arriving in Chico from the west.

Steps should also be taken to enhance the bridges over Big Chico Creek and Lindo Channel. Well-

There is sufficient space on the bridge over Big Chico Creek to add a short median gateway treatment. Wider, colorized bicycle lanes can also help slow vehicles on the bridge and provide more buffer for pedestrians on the sidewalk.

Speeds across the Lindo Channel Bridge can be moderated by colorizing the bicycle lane and a narrow median. The bicycle lane provides a refuge for pedestrians on the narrow sidewalk.



Detail of the mid-block islands/crossings proposed along Nord Avenue. The angled crosswalk through the island improves safety by forcing pedestrians to look in the direction of oncoming traffic.

marked and colorized bicycle lanes and a short median would help slow vehicles on the Big Chico bridge and would provide more buffer for pedestrians on the sidewalks. In the longer term, the City should also explore the possibility of building a trail along Big Chico Creek that would allow residents of the residential neighborhoods to the southwest to cross Nord Avenue and access the downtown, Chico State and other locations in the City.

These projects will also enhance the aesthetic appeal of the area by providing opportunities for increased landscaping, public art, and way-finding signs. Aesthetic treatments may prompt and support redevelopment opportunities within the area.

Street Trees

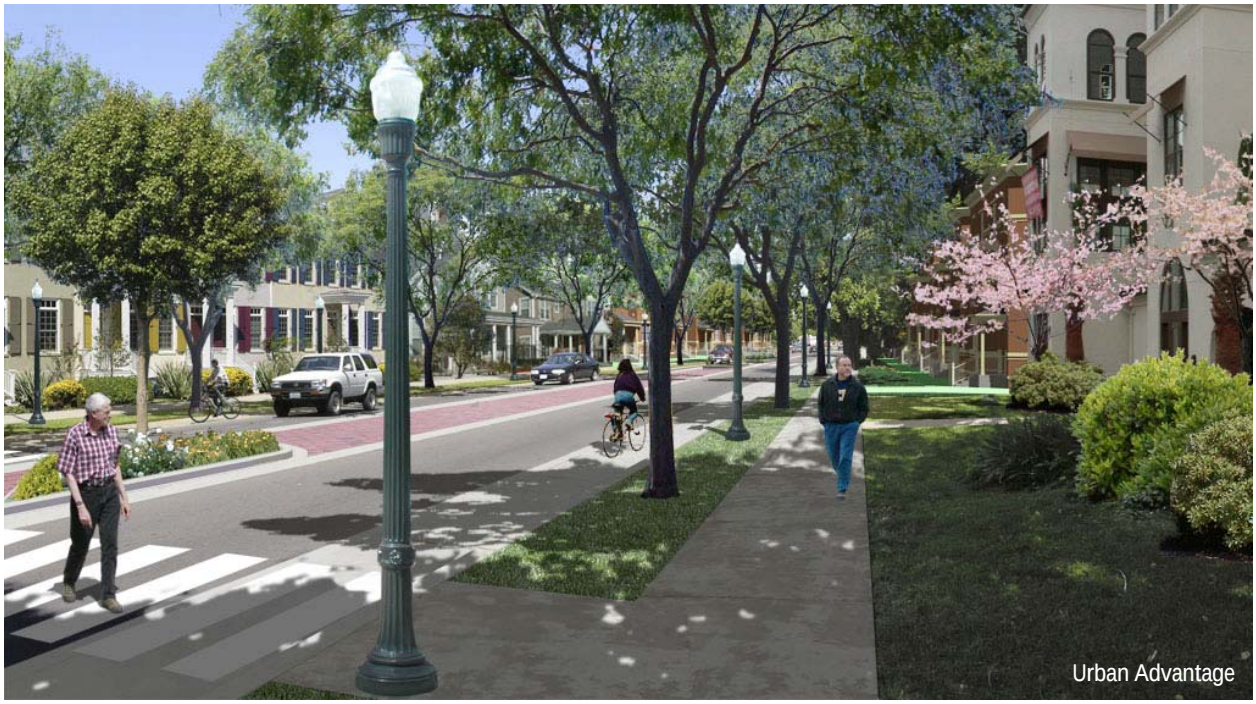
Street trees provide a sense of enclosure which can promote slower vehicle speeds. In addition, street trees contribute to the character of the streetscape. Within the Nord Avenue corridor street trees can also contribute to pedestrian comfort by establishing a shaded space for walkers. The shade also reduces asphalt temperatures while the open area for growing treess contributes to the absorption of rainwater.

To create a unique sense of identity for the corridor, areas that redevelop should also be required to provide trees within their sites. Provision should be made for minimum standards for trees in redeveloping areas.

The potential tree planting design to be used along the reconfigured Nord Avenue should at a minimum be: of a similar species, form, and habit from one side to the other; provide shade; be hearty for local conditions; and require minimum maintenance after an establishment period.

A list of compatible tree species is provided in the Appendix of this document.

Current view of Nord Avenue between West Sacramento and West 1st Street, looking northwest (approximately 1,200 feet from West Sacramento).



Nord Avenue: After

An existing condition image and a photo simulation shows what Nord Avenue could look like with streetscape improvements and revitalization alongside it. The changes to the street including detached sidewalk, landscape strip, trees, lighting, crossing island and crosswalk can take place in the short term as part of building a "complete street." The changes to buildings can be expected to occur over the longer term.

A suggested approach for dealing with the confluence effect of traffic on Nord Avenue and W. Sacramento Avenue. Roundabouts and medians would enable smoother traffic flow. The northwest leg of the roundabout shown on the far left would need to be aligned with the driveway to the Walgreens shopping center. This would require purchasing several properties on the southwest side of Nord Avenue. As described under Long Term Projects, over time this driveway would connect to Columbus Avenue to the north and would provide the opportunity to reconfigure the shopping center into more of an urban village center with mixed-use development fronting the new street and parking behind the buildings.

Mid-Term Projects

The introduction of roundabouts at the intersections of Nord Avenue at W. Sacramento Avenue, W. 8th Avenue, W. Lindo Avenue and West First Street along with the introduction of a colorized and/or textured continuous left-turn lane, occasional mid-block crossing islands, colorized bicycle lanes, bus shelters, and other street furnishings will significantly enhance the street while encouraging drivers to respect other users of the street.

The roundabouts will allow traffic to flow smoothly while allowing all turning movements. Roundabouts bring vehicle speeds down to a level that makes it easier for pedestrians to cross the road, while providing opportunities for aesthetic enhancements through the use of landscape material and public art. The colorized continuous left-turn lane and bicycle lanes will visually narrow the street to further influence drivers to slow down. Finally, the addition of street furnishings and landscaping — such as benches, bus shelters, and street trees — and occasional crossing islands will increase the comfort of the street for

Examples of roundabouts that serve as gateways to redeveloping areas while promoting good driver behavior within the street environment.

all users.

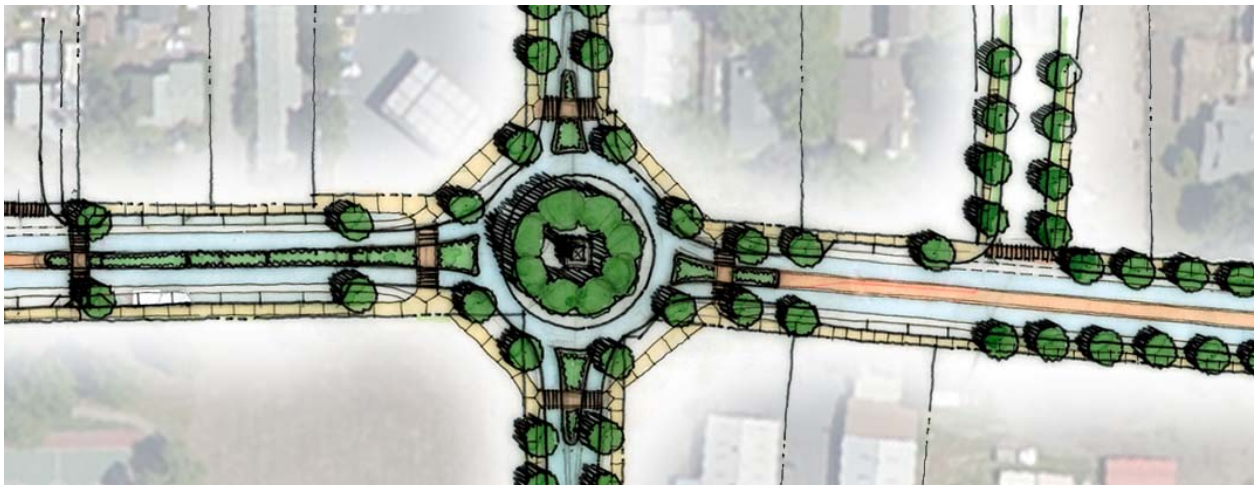
A roundabout at Nord Avenue and W. First Street would serve as a gateway to the University district to the northwest and would help pedestrians — and especially children traveling to Rosedale Elementary School — to cross. A roundabout at this location would signal drivers to slow down without reducing the capacity of the street at the intersection.

The roundabout will also help meter the vehicular traffic to create safe gaps for pedestrians to cross the street. At present, children walking or bicycling to Rosedale Elementary School must cross a street that is 5 lanes and over 60 feet wide. The roundabout will shorten that distance to two 14-foot lanes. During school drop-off and pick-up hours a crossing guard at one leg of the intersection can further assist children to cross.

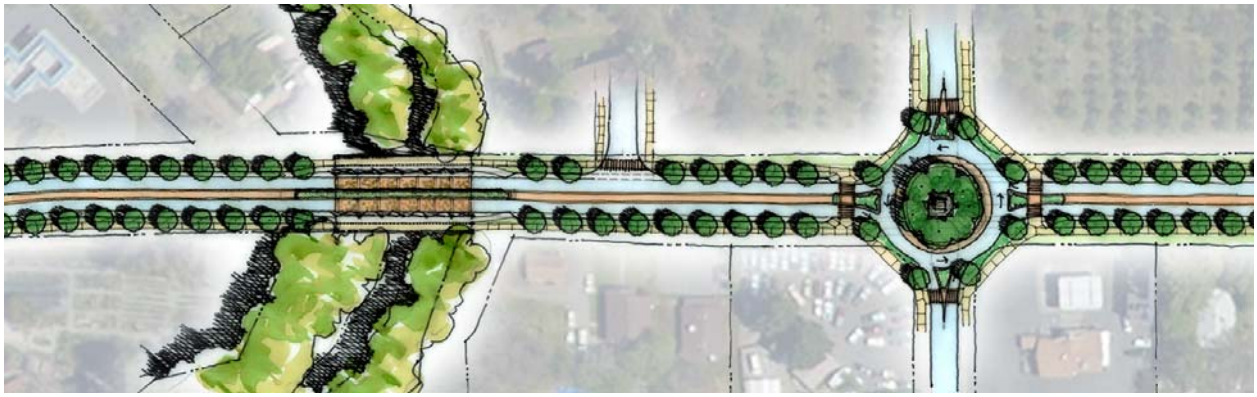
The transition from four-lane road to three-lane complete street could occur at the intersection of S.R. 32 and W. First Street with the introduction of a roundabout.

One lane roundabouts are easy to cross since vehicle speeds are low, the crossing distance is shortened to less than 14-feet and the pedestrian only has to deal with traffic from one direction. Drivers are also more likely to yield to pedestrians at these slower speeds.

Since vehicles are slowing to 20-25mph, bicyclists entering the roundabout can either take the lane and proceed through the circle or exit and cross at the pedestrian crosswalk. Sidewalks should be wide enough to prevent conflicts with pedestrians.



A roundabout is proposed at the intersection of Nord Avenue and West 8th Avenue. This roundabout would help children that attend Emma Wilson Elementary School get across Nord Avenue by shortening and simplifying the crossing. This roundabout would also set the stage for a mixed-use village to develop over time on adjacent sites.



Roundabout proposed at the intersection of Nord Avenue and Lindo Avenue would serve as a gateway from the west to Chico. Roundabouts work well as gateways since they signal to motorists that the area they are entering is changing. The central island in a roundabout can also be used to place signs, art work or special landscaping treatments. As described in the Livable Streets Toolbox that follows, roundabouts can accommodate all types of vehicles more efficiently than typical intersections.

The ability to offer transit service as a viable alternative to using private automobiles is one step toward establishing a truly multi-modal livable street environment. The availability of transit does not, by itself, ensure that the transit service will be successful. The street plays a direct role in the success of transit facilities.

In order to promote ridership for transit services the street environment must contribute to a sense of safety and comfort, riders must be afforded safe and secure travel to and from the transit facilities, and the transit service should be affordable, clean, and timely.

Well-lit transit stops — with seating, bicycle storage, and trash receptacles — should be located along Nord Avenue. One option worth exploring as a transit option for CSU Chico students is the use of smaller scale transit vehicles (see below) that can circulate on-street but also take advantage of off-street trails like the one adjacent to the railroad.

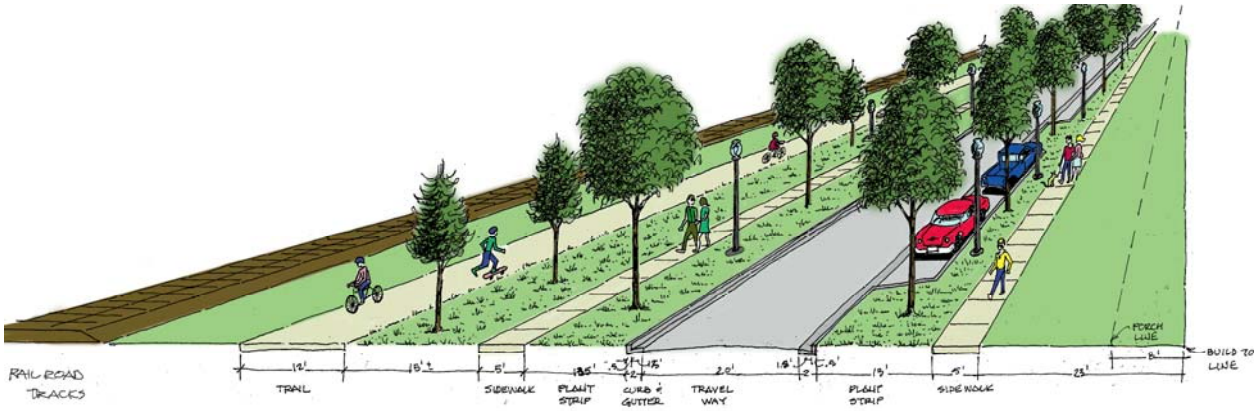
As development along Nord Avenue takes place with better connections to the north and along the railroad tracks, the City should examine the viability of building a second trail on the south side of the tracks. At present, the trail on the north side of the tracks can only be accessed at W. 8th Avenue and W. Sacramento. Participants in the workshop pointed out that a second trail on the south side — with better connections to Nord Avenue — would make it possible for residents and students in this area to access the trail. In addition, to improve safety along the trail, efforts should be made to provide more "eyes on the trail" as new development takes place near the railroad tracks.

Smaller scale transit vehicle options.

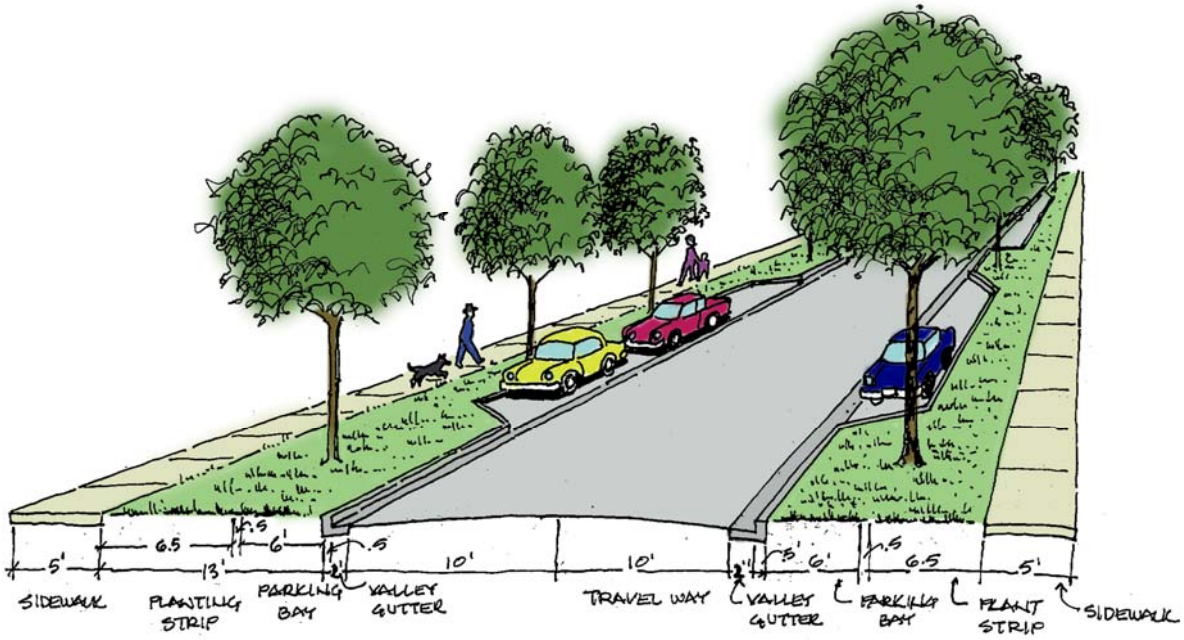
Transit shelter and bus bay examples.

Long Term Projects

New network connections should be introduced to the Nord Avenue corridor through redevelopment. The new network streets would provide alternative routes for local trips to reduce the demands placed upon Nord Avenue. As mentioned in Recommendation #3, building a short street just north of Emma Wilson Elementary (see below) will add to the road network and reduce the need to use Nord Avenue for short trips. At present, residents who live near Oak Way are required to drive out to Nord Avenue to get to the school. This short connector between the school and the park would make it possible to reach the school entrance on West 8th Avenue without driving out to Nord Avenue, thus reducing congestion on Nord especially during peak morning hours.



A suggested cross section for an additional network street proposed parallel to the railroad where homes would be located on one side of the street and the railroad tracks would be located on the other side. This drawing shows the new trail on the south side of the tracks. A fence would be installed between the tracks and the trail.



A suggested cross section for an additional network street proposed parallel to the railroad where homes would be located on both sides of the street.

A new street running along the railroad corridor would add additional capacity to the street system while redevelopment of larger parcels at the W. 8th and Sacramento Avenues could introduce a mixture of housing, office, and retail uses that would create shorter trips for residents in the area that require these local services and facilities.

A short connector street from Oak Way to W. 8th Avenue just north of Emma Wilson Elementary School would allow residents living to the southwest to access the school without adding to the congestion on Nord Avenue..

This diagram illustrates proposed streets connections as a way to expand the existing network.

The areas near where Sacramento Avenue and 8th Avenue intersect with Nord Avenue are prime nodes for redevelopment.

The southeast corner of Nord Avenue and West Sacramento has the potential to become a bustling small mixed-use center, complete with two to three stories of housing above. Parking could be located in a separate location 100-200 feet distant.

The large parcel of this conventional strip-commercial center presents a good opportunity for one entity to create a dense mixed-use development that is in keeping with the scale and character of the surrounding neighborhood. The development could offer goods and services, that area residents now have to drive to, within walking distance. This would reduce the vehicular demand placed on Nord Avenue.

Conceptual plan for a mixed use village at the intersection of Nord Avenue and West Sacramento.

In order to maximize parking these new side streets can be designed with the following features:

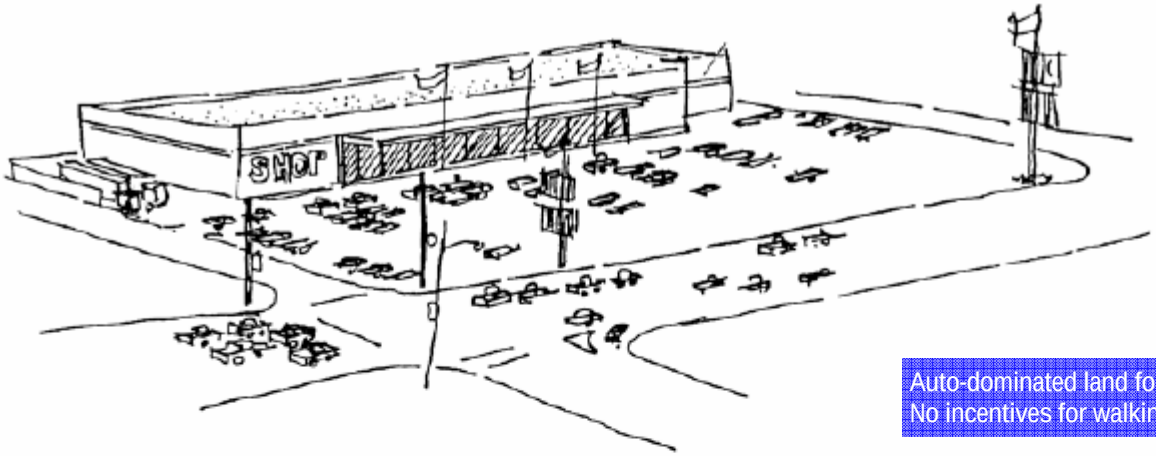
1. 60 degree angle parking.
2. If desired, use back-in angled parking. Back-in parking is considered superior to pull-in parking and requires 7 feet less street width than straight-in angled parking..
3. Parking requires either curbing or some posi-

Examples of what a mixed-use village center might look like.

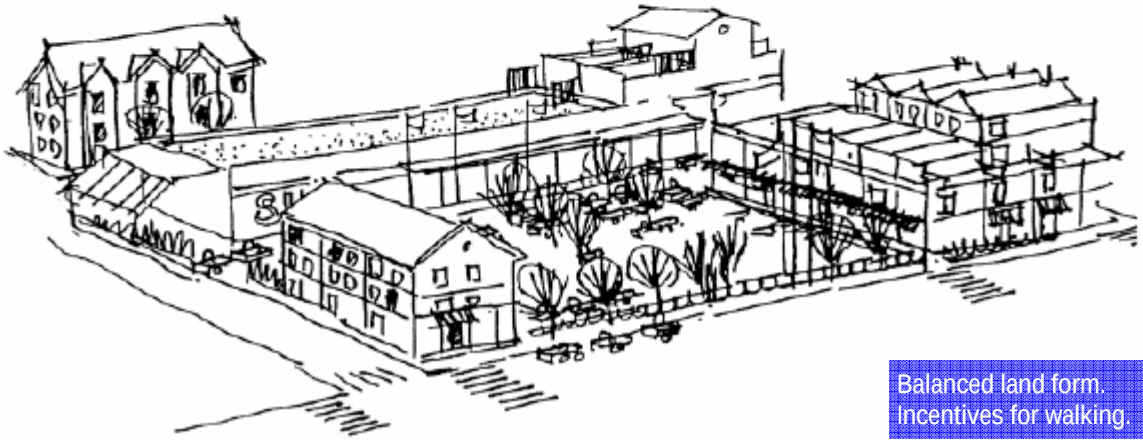
tive restraint feature or material, such as bollards.

4. Angled parking and bike lanes can work together, especially if angled parking is back-in only. Otherwise, a larger buffer or separation from parking movements is required.
5. Valley gutters (2-3 feet) are preferred. By using valley gutters it is possible to reduce parking stall width to 6 foot.

Reverse angled parking is efficient and safe.



Auto-dominated land form.
No incentives for walking.



Balanced land form.
Incentives for walking.

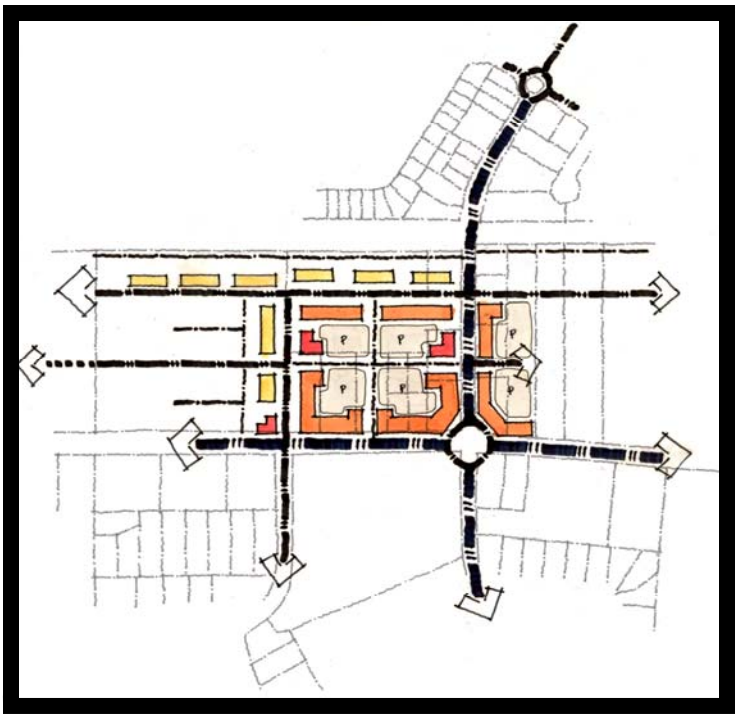
Nord Avenue: Before (near West Sacramento Avenue looking northwest)

Nord Avenue: Rebuilt, before redevelopment activity. Urban Advantage

Nord Avenue: After Urban Advantage

The northwest corner of Nord Avenue and W. 8th Avenue also has the potential to become a small mixed-use center with retail, housing, and parking.

The land ownership pattern in the area would require the aggregation of several properties over time, or the vision could be realized through incremental change on one parcel at a time. In either scenario the envisioned dense mixed-use development must be in keeping with the scale and character of the surrounding neighborhood. Like the vision for a mixed-use center at W. Sacramento Avenue and Nord Avenue, this development could offer goods and services, that area residents now have to drive to, within walking distance of the residential neighborhoods to the north and south of Nord Avenue.



Conceptual plan for a mixed use village at the intersection of Nord Avenue and West 8th Avenue.

Examples of redevelopment that contribute to the complete street environment while providing goods and services to residents living in the surrounding areas.

The following Goals and Policies have been included to serve as a guide to implementing a more diverse mode of transportation use within Butte County. The policies should be reviewed for consistency and/or redundancy with current policies. In addition to these policies, setting benchmarks and timeframes to incorporate new policies within the Land Development Code would be necessary for further implementation.

Two goals are identified below for Streets and Intersections and Parking and Transit. Policies are outlined as follows.

Streets and Intersections Goal: Enhance quality of life, safety, retail trade and association in the Nord Avenue study area by restructuring public circulation systems, connectivity, aesthetics, and placemaking for motorists, transit, pedestrians and bicyclists.

Streets and Intersections, Policy 1: The Nord Avenue street network should be modified to reduce automobile speed to improve safety, capacity and multi-modal compatibility with pedestrians, bicyclists, transit, freight deliveries and other travel. (Note that vehicle capacity on most urban roadways is maximized at 30 mph. Higher speeds reduce capacity). As a general policy, traffic flow shall be enhanced by reducing delays at intersections through use of modern roundabouts.

Streets and Intersections, Policy 1.1: Streets and intersections should not be wider than necessary to perform their mission. Wider streets and intersections encourage higher automobile speeds, compound sight restrictions, make street entries more challenging, expose pedestrians to longer and riskier crossings, cause losses of traffic efficiency, especially at intersections, create added storm water runoff, and add to urban temperatures.

Streets and Intersections, Policy 1.2: The City, County and State shall review and where feasible implement traffic calming and traffic management devices and techniques such as, roundabouts, street and lane narrowings, curb extensions, appropriate speed turn radii, trees, shrubs, planter strips and crossing islands on: Nord Avenue, W. First Avenue, W. Lindo Avenue, W. 8th Avenue, W. Sacramento, and several residential streets in the study area.

Streets and Intersections, Policy 1.3: The City, County and State shall review and where feasible implement modern roundabouts at the following intersections: W. First Avenue, W. Lindo/West Glenwood Avenue, W. 8th Avenue, W. Sacramento.

Streets and Intersections, Policy 1.4: The City, County and State shall review and determine methods to rebuild and specially streetscape Nord Avenue, approaches to and the first 500 feet of all network streets, and consider modern roundabout intersections with appropriate materials to calm traffic, improve and visually enhance the corridor.

Streets and Intersections, Policy 1.5: The City, County and State should, where feasible, create attractive and functional pedestrian and bicycle facilities to connect established trails, commercial centers, apartments and neighborhoods along the perimeter of Nord Avenue.

Streets and Intersections, Policy 2: The use of bicycles shall be fully supported as a primary mode of transportation in the Nord Avenue study area.

Streets and Intersections, Policy 2.1: The City, County and State shall research the possibility of using the South side of the Union Pacific Railroad for a multi-purpose bicycle trail.

Streets and Intersections, Policy 2.2: The City, County and State shall research and significantly upgrade lighting, landscaping and buildings/windows to provide surveillance to trail connectors from adjacent parcels along Nord Avenue.

Streets and Intersections, Policy 2.3: All commercial, civic, school, institutional and employment centers shall include attractive, convenient, functional and secure bicycle racks, lockers and storage to accommodate both employees and customers.

Streets and Intersections, Policy 3: Walking shall be fully supported as a viable form of alternative transportation.

Streets and Intersections, Policy 3.1: The City, County and State shall implement sidewalk improvements on both sides of the street, where feasible, throughout the study area. In no case shall essential sidewalk space be sacrificed for other uses.

Streets and Intersections, Policy 3.2: The City, County and State shall, where feasible, prioritize completion of sidewalks on the following streets: All portions and both sides of Nord Avenue from W. East Avenue to West First Street. Highest priority should be within one-half mile of all schools and one-half mile of W. Sacramento. Other priorities include all network street sections within 1/4 mile of Nord Avenue.

Streets and Intersections, Policy 3.3: The City, County and State should establish a streetscape infrastructure improvement program, planting appropriate street trees and ground cover throughout to enhance pedestrian activity and create a green, attractive streetscape. All trees and plantings should specify varieties and locations that allow proper maintenance of sight lines for vehicle operations.

Streets and Intersections, Policy 3.4: The City, County and State shall improve pedestrian and bicycle crossing intersections with adjacent parcels which should include transit stops and all trail crossings (W. Lindo, W. 8th, W Sacramento). Crossing improvements shall include installing lights, adding a raised, landscaped crossing island, where feasible, enhanced pavement markings, required MUTCD crosswalk signing and markings, placing reflectors or flashing lights in the pavement.

Streets and Intersections, Policy 3.5: The City, County and State shall review and where feasible add pedestrian scale street lighting to Nord Avenue and primary circulation routes.

Streets and Intersections, Policy 3.6: The City, County and State shall review and where feasible add enhanced pedestrian crosswalk markings at all intersections and on all legs where pedestrians desire to cross.

Streets and Intersections, Policy 3.7: The City, County and State shall review and where feasible add pedestrian countdown signals to all signal controlled intersections.

Streets and Intersections, Policy 3.8: In downtown and neighborhood center locations, the City, County and State shall review and where feasible eliminate pedestrian push button controls, allowing crossings to automatically activate with each cycle. Crossing release times shall be set for maximum times feasible for efficient signal cycles.

Streets and Intersections, Policy 4: Impervious surface paving should be reduced to allow increased water infiltration.

Streets and Intersections, Policy 4.1: The City, County and State should create porous design guidelines based on soil characteristics as applicable to require porous paving material, grasscrete or other material as deemed appropriate by County Departments for residential driveways, public right-of-ways, low-circulation

parking lots or other feasible elements of site development.

Parking and Transit Goal: Develop an effective, efficient multi-modal transportation system for the Nord Avenue community. Reduce automobile impacts on the community by minimizing automobile dependence and the rate of bicycle and pedestrian-related collisions on Nord Avenue.

Parking and Transit Policy 1: In residential neighborhoods, residents should have priority use of existing on-street parking spaces. Parking should not be provided in amounts and locations that encourage residents to unnecessarily bring automobiles into the community. The full economic costs of automobile ownership should be internalized to users and not subsidized by the public.

Parking and Transit Policy 1.1: The City and County shall establish a residential parking permit program that includes allowances for visitors, guests, and daily for-sale parking passes, while offering subsidies for low-income persons. The County shall examine effectiveness of the parking permit program after implementation.

Parking and Transit Policy 1.2: The City and County shall research options for remote and community parking lots for vehicle storage.

Parking and Transit Policy 1.3: The City and County shall research options reducing the number of required parking spaces with apartments, mixed use and other multiple family housing. The goal of this study shall be to make more land available for green space, additional housing and additional land uses.

Parking and Transit Policy 1.4: The City and County shall research options for reduced parking lane widths. Current standards of 9 feet may be excessive. This reduces overall parking, and increases stormwater runoff, heat gain and asphalt. Widths of 8.5 feet and 8.0 feet should be analyzed, especially for longer term parking.

Parking and Transit Policy 1.5: The City and County shall research options with the University for charging "true cost parking fees" for on campus parking. By not overly subsidizing parking, walking, bicycling and transit become more competitive.

Parking and Transit Policy 2: In any new mixed use village, short-term parking in front of businesses should be available for customers and existing parking constraints in the district should be alleviated.

Parking and Transit Policy 2.1: The City and County shall research and where feasible provide new on-street parking spaces on any newly created commercial streets in the mixed use village area.

Parking and Transit Policy 2.2: The City and County shall seek funding sources for the design, construction, and maintenance of potential public parking facilities within designated mixed use districts.

Parking and Transit Policy 2.4: Funds generated by parking meters and parking programs shall stay within the Project Area and be used to implement projects and programs identified in the master plan.

Parking and Transit Policy 2.5: The City and County shall send letters to the owners of the parking lots identified as potential public lots asking if they would be interested in participating in a public parking program. Where an owner expresses interest, the city or county shall coordinate with Planning and Development for permit requirements and procedures, while working with the owner to provide public parking spaces as quickly as possible.

Parking and Transit Policy 2.5: The City and County shall send letters to owners of commercial proper-

ties to assess voluntary support of reduced driveways and driveway dimensions

Parking and Transit Policy 3: Public transit options should be frequent, reliable and rapid, providing all-day services to make public transit more attractive than driving for most Nord Avenue residents.

Parking and Transit Action 3.1: The City and County shall continue discussions with the transit agency to increase frequencies on and simplify key routes serving Nord Avenue, extend service later into the evening and night, and locate potential future bus stops.

Parking and Transit Action 3.2: The City and County should work with transit officials to provide a new EZ campus transit service that includes a new route that makes use of the rail/trail and minimizes headways (10 minutes or less) during peak class and activity hours.

Parking and Transit Action 3.3: The City and County shall study funding mechanisms to provide reduced rate transit passes to all Nord Avenue residents.

Parking and Transit Policy 4: Car sharing should be studied in the community to reduce the number of automobiles on Nord Avenue and to provide residents with a reasonable alternative to owning a car.

Parking and Transit Action 4.1: The City and County shall research and if feasible establish a funding source to subsidize start-up costs for a car-sharing program along Nord Avenue.

Parking and Transit Action 4.2: The City and County should research and if feasible encourage car-sharing firms to establish along Nord Avenue, on the campus and in the surrounding community.

Parking and Transit Action 4.3: If a car sharing program is implemented, their vehicles shall be exempted from parking permit expenses.

Note on the purpose of this report: *This report provides visual and text support to motivate and aid Chico in becoming more walkable, bicycle-friendly, complete and livable. All specific location treatments mentioned in this report are conceptual only. A complete and thorough public process and engineering analysis is required before these concepts are finalized. All concepts shown in this report have been built in a variety of contexts, and have proven workable in a variety of communities.*