City of Woodland

REPORT TO MAYOR AND CITY COUNCIL

AGENDA ITEM

TO: THE HONORABLE MAYOR
AND CITY COUNCIL

DATE: October 6, 2009

SUBJECT: Woodland Davis Alternative Transportation Corridor (ATC) Feasibility Study

Report in Brief

The City of Woodland, City of Davis, and County of Yolo are working together to update the 2001 Davis-Woodland Bikeway Feasibility Study and to evaluate options for an alternative transportation route to connect these three communities (attached).

The long-term objective of this effort is the creation of an efficient, safe, and aesthetically pleasing off-road alternative transportation route between the cities of Davis and Woodland that may accommodate bicyclists, low-speed electric vehicles and serve as a recreational and transportation amenity.

The Alternative Transportation Corridor (ATC) Feasibility Study (attached) provides an in-depth look at the infrastructure necessary to support such a multi-use alternative mode corridor, make a recommended alignment selection, and allow the agencies (City of Woodland, City of Davis, and Yolo County) to be informed in deciding the next steps.

Staff recommends that the City Council approve the Feasibility Study and provide comment and direction regarding the City's participation in this project.

Background

The development of a dedicated bikeway connecting Woodland and Davis has been discussed periodically by Woodland, Davis, and Yolo County officials over the past several years. In 2001, the cities of Davis, Woodland, County of Yolo (Cities/County) and the Yolo-Solano Air Quality Management District funded The Davis-Woodland Bikeway Feasibility Study to examine alternatives for bicycle routes between the cities of Davis and Woodland. This study recommended several improvements on County roads linking the two cities and included pursuing a dedicated bikeway after completion of the County road improvements.

The 2001 study culminated in the construction of an on-street bikeway between Davis and Woodland by widening CR-99D, CR-29, and CR-99. The final piece of the on-street bikeway is currently under construction with an estimated completion of the fall of 2009.

In late 2007, interest in a dedicated bikeway project was renewed for several reasons. These reasons included:

- Safety concerns stemming from the cycling community reaction following a tragic fatal accident last year involving a Woodland cyclist.
- The availability of State and Federal funding for projects that promotes alternative forms of transportation.
- The success of an award winning and nationally recognized City of Lincoln Neighborhood Electric Vehicle (NEV) Transportation program encouraged community members, City and County leaders to examine the possibility of integrating this environmentally friendly alternative mode of transportation into their General Plans.
- Interest in evaluating new options to accommodate the growth in southeast Woodland and surrounding areas.

On July 15, 2008 the City Council approved the City's participation in a joint feasibility study for an alternative transportation corridor between Woodland and Davis at a total cost not to exceed $150,000. Woodland's share of this cost was 40% or $60,000; of that amount about $41,000 has been spent so far.

The feasibility study is being administered by the City of Davis. A consultant agreement with Bennett Engineering Services was approved by the Davis City Council on December 16, 2008. Bennett Engineering Services has worked with the jurisdictions to hold community meetings and meet with impacted stakeholders. A community kick-off meeting was held in the Woodland Community Center on February 23, 2009. A second community meeting occurred on April 27, 2009 at the Davis Veterans Memorial Center. The following stakeholders were contacted and their input is summarized in the Feasibility Study: bicycle groups, Yolo Department of Agriculture, Yolo Farm Bureau, Caltrans, Law Enforcement, and various land stakeholders.

The feasibility study has been finalized and is being taken by City of Woodland, City of Davis, and County of Yolo staff for information to each respective jurisdiction's Commissions in September and October 2009 and for approval by each respective Council/Board during the September and October 2009 timeframe.

Discussion

Alternative Transportation Corridor Alignment 2 is being recommended by the Feasibility Study. Alignment 2 starts near the J Street/Covell Boulevard intersection in Davis and ends near the CR-24A/6th Street intersection in Woodland. This alignment runs parallel to the railroad for its entire length. Approval of the Feasibility Study by the Woodland City Council, Davis City Council, and Yolo County Board of Supervisors would be required to move the project forward.

The Feasibility Study further recommends that the Bike only cross section be constructed. NEVs have been eliminated from consideration for the following reasons:

1. The project team was concerned about the additional $3.7 million cost associated with the wider path required to accommodate NEVs versus the relatively few number of projected NEV owners.

2. There are concerns regarding the future marketability of NEV's for inter City travel. Within 3-5 years, industry experts are predicting that a larger product line of electric vehicles will be available that can travel on highways and freeways. Because of this change in the electric vehicle market, it is anticipated that there will be a reduced demand for NEV travel between cities.

3. There are concerns that the existing NEVs would not be able to travel the whole distance between Woodland and Davis without needing to recharge.

Staff from each of the agencies is in discussion regarding the following issues both now and during upcoming project phases. The issues and associated comments from the September 15 Council Infrastructure Subcommittee meeting are noted in the summary of each issue below:

1. **Acquisition of Right of Way:** Each agency is discussing with their elected officials the interest in the acquisition of right of way and which agency should lead this effort. The Infrastructure Subcommittee expressed concern regarding the acquisition of right of way given the various uncertainties associated with the project at this time.

2. **Continuous ATC Maintenance Costs:** Annual maintenance costs, unlike the design/right of way/construction costs, are not eligible to be paid from federal grant funds. Continuation of the cost split from the direction for the feasibility study would divide the costs 40/40/20 with the cities each funding 40%. The estimated maintenance costs for Woodland, assuming a 40% funding, would range from $12,000 to $20,000 per year. At this point the City would be unable to identify a source to fund this additional expense. The Infrastructure Subcommittee expressed some concern regarding this financial impact.

3. **Conflicts with Agriculture:** The Study identifies potential conflicts with agricultural activities such as aerial spraying. Discussions have focused on fencing, signage, buffers, and possible closures during aerial spraying operations. Staff will be exploring several alternatives to address this issue during the next phase of the project.

4. **Need for Matching Funds:** If the three agencies are committed to seeking a federal grant to fund the construction of the ATC, matching funds will be required. The federal grant funds match component ranges from 11.47% to 20%. In terms of the local match funding, the current cost break distribution for the ATC study is split 40/40/20 with the cities of Woodland and Davis responsible for 40% of the cost. At 11.47% local match, the City's 40% cost would range from $435,000 to $610,000. Woodland's share at a 20% scenario would be up to $760,000. City staff has contacted SACOG and there is a possibility of using state funds to cover the local match cost. Without a reduction in federal matching requirements or state funding to cover the local match, the City does not have enough

funding to finish the project without altering the 10-year capital improvement program. This was a very significant concern to the Infrastructure Subcommittee.

5. **Railroad Relocation Study:** The cities of West Sacramento, Woodland and Davis have commissioned a "white paper" to outline the potential impacts of relocating the Sierra Northern Railway and removal of the Fremont Trestle. This study is evaluating the feasibility of relocating the current rail line to a point east of the cities of Davis and Woodland and then the current railroad right of way would be available for a bikeway. The white paper is nearly completed and it is unclear at this point whether or not there would be any further action regarding this concept. At this point, consideration of the ATC needs to proceed under the current situation with the railway in its current location.

The following table summarizes the estimated costs of Alternative 2:

	Bike Only
Environmental and Pre-Design	$503,256
11.47% local match:	$57,723
40% Woodland Share of 11.47%:	$23,089
ROW Acquisition and Design	$2,075,754
11.47% local match:	$238,089
40% Woodland Share of 11.47%:	$95,236
Construction	$6,919,770
11.47% local match:	$793,698
40% Woodland Share of 11.47%:	$317,479
Total	**$9,498,780**
11.47% local match	**$1,089,510**
40% Woodland Share of 11.47%	**$435,804**

Fiscal Impact

The cost for all studies, design, and construction will be covered by state and federal grant funding which usually has a local match funding requirement. The next phase (environmental, pre-design, ROW acquisition, and design) could cost the City approximately $120,000; howver, total matching costs to complete the project could be in the range of approximately $436,000 (40% share of 11.47% local match for Env/ROW Acquisition/Design/Construction) to $760,000 (40% share of 20% local match for Env/ROW Acquisition/Design/Construction) depending on the type of grant funding

match required (11.47% or 20%). The City is actively working with SACOG to investigate the possibility of using other sources as a federal match. The City may be able to use state funds to match federal funds.

Approximately $29,000 of project funding is available and can be carried forward to the next phase of the project. Staff will need to identify additional funding in the future depending on the local match requirement

Public Contact

Staff has posted the City Council agenda, and held community and stakeholder meetings. A community kick-off meeting was held in the Woodland Community Center on February 23, 2009 and a second community meeting occurred on April 27, 2009 at the Davis Veterans Memorial Center.

Commission Recommendation

The feasibility study has been discussed at the September 17, 2009 Planning Commission and at the September 21, 2009 Traffic Safety Commission.

The Planning Commission was generally favorable for the project but did express concerns about the cost of the project.

The Traffic Safety Commission made comments regarding pedestrian accessibility and had questions regarding the items included in the cost estimate for the project.

Council Committee Recommendation

City staff met with the Infrastructure Subcommittee April 7, 2009 and September 15, 2009 to keep the Subcommittee appraised of the project status. The April 7 Subcommittee meeting discussed the proposed routes, proposed cross-sections, connectivity issues once the ATC enters the City limits, and sought feedback in progressing with the feasibility study. The September 15 Subcommittee meeting discussed the recommendations of the feasibility study and reviewed the critical issues noted in the Discussion section.

As noted herein, the Infrastructure Subcommittee was generally supportive of deleting the NEV option. Concerns were also expressed regarding right of way acquisition, annual operating costs and potential impacts on the long term capital program in order to meet the federal grant matching requirements. Given Yolo County's fiscal challenges, the Subcommittee was also concerned regarding the project cost distribution between the cities and the county. It was noted that staff will address this issue in an upcoming 2x2 meeting.

Alternative Courses of Action

1. Approve the Feasibility Study and provide comment and direction regarding the City's participation in this project.

2. Direct staff to identify options for providing funding to continue City participation in this project.

3. Direct staff to cease further participation in this project

Recommendation for Action

Staff recommends that the City Council approve Alternative No. 1.

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Reviewed by: Brent Meyer, PE, SE, TE
Principal Civil Engineer

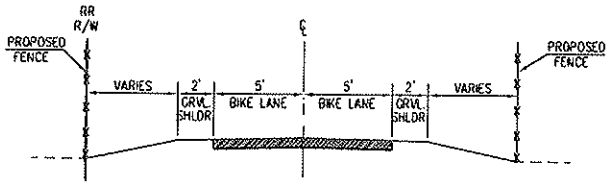
Reviewed by: Paul Siegel
Deputy Director CDD

Mark G. Deven
City Manager

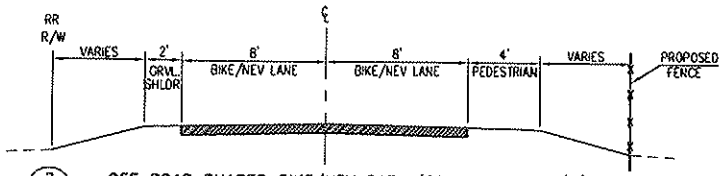
Attachments: Map of Alignment Routes
Figure showing various considered ATC cross-sections
Feasibility Study

POTENTIAL ROUTES FOR ALTERNATIVE TRANSPORTATION CORRIDOR FEASIBILITY STUDY

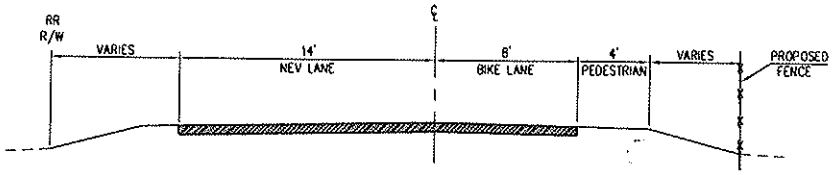
CLASS I - OFF ROAD PATH



1 OFF ROAD BIKE PATH
NOT TO SCALE

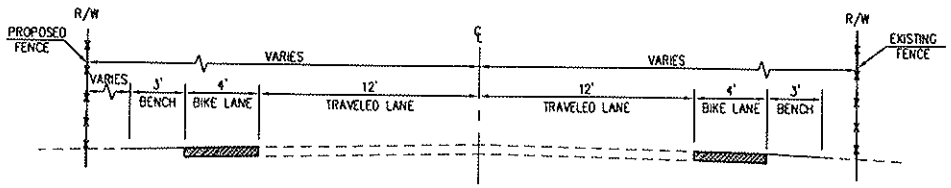


2 OFF ROAD SHARED BIKE/NEV PATH (CONSTRAINED R/W)
NOT TO SCALE

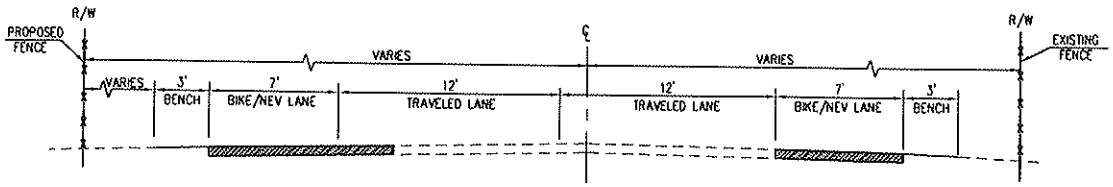


3 OFF ROAD TWO WAY BIKE/NEV PATH (UNCONSTRAINED R/W)
NOT TO SCALE

CLASS II - ON STREET LANES



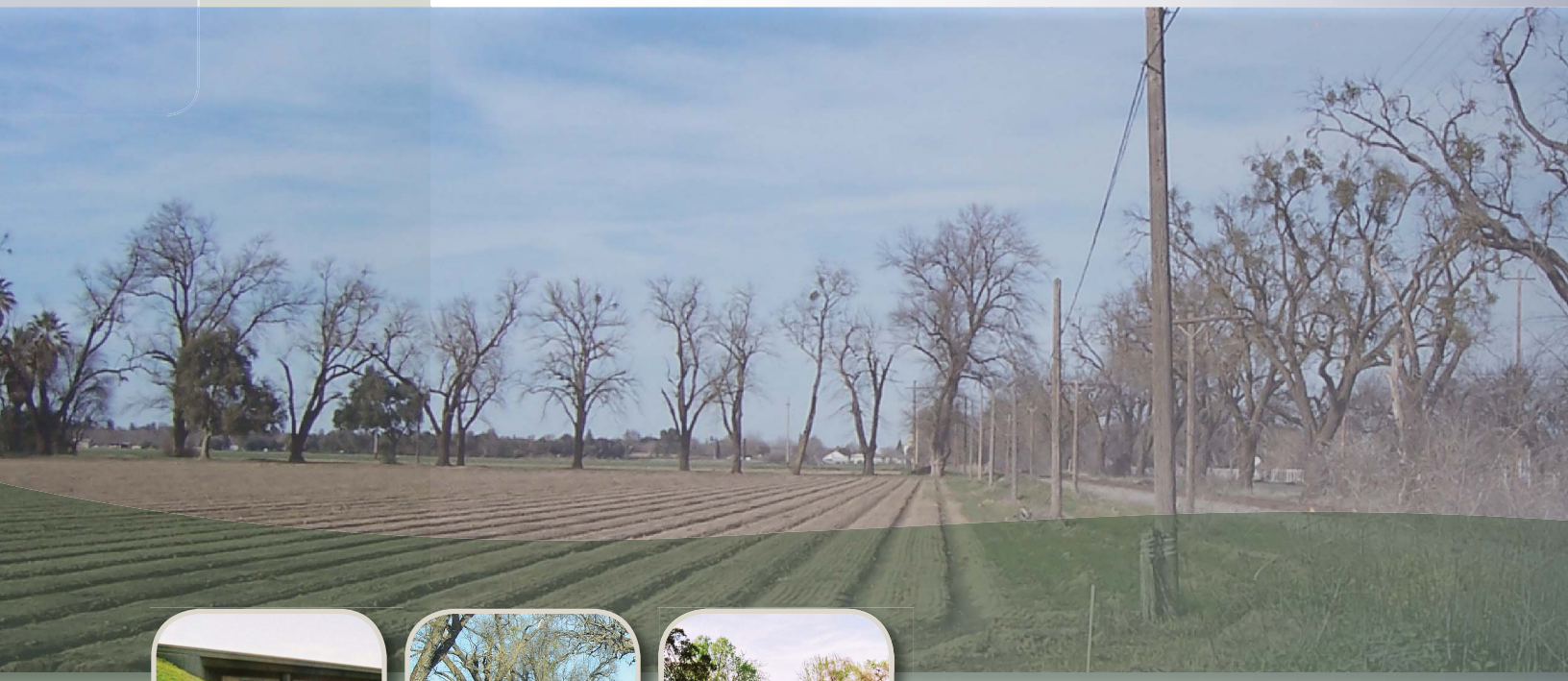
4 ON STREET BIKE LANE
NOT TO SCALE

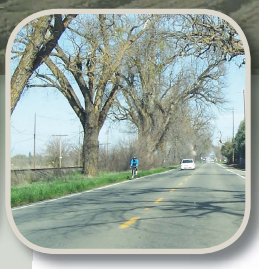


5 ON STREET BIKE/NEV LANE
NOT TO SCALE

Alternative Transportation Corridor

FINAL FEASIBILITY STUDY





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This Feasibility Study has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

LEO RUBIO, REGISTERED CIVIL ENGINEER

DATE 9/29/09

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APPENDICES

1 Introduction

1.1 Project Background

In 2001, Yolo County prepared a feasibility study to improve the bike connection between Woodland and Davis, in partnership with the City of Woodland, the City of Davis, and the Yolo- Solano Air Quality Management District. Based on the recommendations from this study, Yolo County has been working to implement projects to improve the safety and convenience of on-street bike lanes between the two cities (i.e. along County Road 99, 27, and 99D).

Options for an off-road bike path were studied in the 2001 report but were deemed less feasible due to the cost of implementation. However, renewed interest in an off-road route was prompted by the fatality of a bicyclist early in 2008 along County Road 99. Furthermore, the concept of creating a multiuse alternative transportation corridor that would accommodate a variety of modes including bikes, pedestrians, and low-speed electric vehicles was also introduced. While the integration of these various modes into a combined dedicated route would have challenges, the potential for creating an alternative route that is safe and environmentally sustainable is significant. Low-speed electric vehicles (LSVs), also known as Neighborhood Electric Vehicles (NEVs) are electronically limited to speeds of 25 mph by federal requirements and may be driven on streets with speed limits of 35 mph or less. (Refer to **Appendix B** for a summary of NEVs).

In response to increasing interest in an alternative transportation corridor, the Yolo County Board of Supervisors (Board) adopted a "Woodland-Davis Bike Path" as a high priority in the 2008 Strategic Plan. On May 6, 2008, the Board directed their staff to work with the City of Davis, the City of Woodland, and the University of California at Davis to identify funding and share responsibility for an update of the 2001 Davis-Woodland Bikeway feasibility study that would evaluate alternative transportation corridor options, because: 1) the original feasibility study did not look at the feasibility of an electric vehicle corridor; and 2) the cities and some county officials have expressed interest in evaluating new options for a dedicated bike path, in part because of the recent growth in southeast Woodland, and 3) the increasing emphasis of the state and federal government on climate change may provide additional funding opportunities for projects that promote alternative forms of transportation.

The County of Yolo, the City of Davis, and the City of Woodland sponsored a public outreach and planning process to jointly develop a 2009 Davis-Woodland Alternative Transportation Corridor Feasibility Study (ATC Study). Two community meetings were held, and are a critical element of this ATC Study. The ATC Study focuses on three alternative alignments chosen for further consideration by the collective jurisdictions. The three alternative alignments are described in further detail in this study.

1.2 Recommendations

Based on the information provided by the three jurisdictions, and feedback from the community and various stakeholders, the recommendations of this ATC Study are as follows:

The recommended alternative is Alignment 2, shown in **Figure 1-1**. It would start at E. Covell Blvd. and travel on the east side of the Union Pacific Railroad (UPRR) tracks up to County Road 25A, then turn left and head north on the west side of UPRR tracks to CR 24A where it meets 6th Street.

The alternative Alignment 2 is recommended for the following reasons:

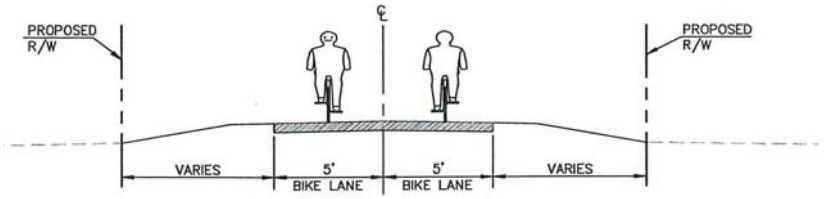
- This option is consistent with the community desires to provide a direct route between the two cities.
- This alignment is consistent with the direction from the collective jurisdiction Boards and Councils and workshop participants for an off-road option.
- This option provides the most direct link to existing and planned activity centers.
- Caltrans has provided positive feedback to construct the alignment within Caltrans right-of-way under the State Route 113 overhead.
- There is land developer interest to work with the jurisdictions to allow approximately 2.7 miles of this alignment within their property boundaries.
- This option provides the safest route between the two cities and minimizes crossing conflicts between modes.

Other recommendations:

- Consider phasing the alignment with a route to the Spring Lake Community that begins from County Road 27, and routes northeast towards the City of Woodland. This phase could be added as development progresses, and as demand warrants it. The preliminary construction and right-of-way acquisition cost estimate for the bike-only path is $2,000,000.
- Provide a means to educate the public about the corridor through public forums and/or local media advertising.

Bike Path

This study examined the feasibility of a shared-use corridor, which included Neighborhood Electric Vehicles (NEVs). However, on September 25, 2009, the jurisdictions mutually agreed to recommend the bike-only path for further study. The jurisdictions understand that there could be inconsistencies in this report due to the jurisdictions' recent decision. To avoid an extensive rewrite of this study, only this Section 1.2 has been modified to exclude NEVs in the recommendation.



Off Road Bike Path

The Preliminary construction and support cost estimate for this option is $9,500,000, with an estimated annual maintenance cost of $56,000 – See Appendix E for cost estimate breakdown spreadsheets.

1.3 Benefits and Concerns

The following is a list of benefits and concerns with including NEVs along the corridor:

Benefits:

- The combined bike/NEV path would encourage alternative modes of transportation.
- The wider lane width would allow bicyclists to ride side-by-side, or more space to pass other bicyclists and pedestrians.
- The benefits from expanding NEV use include, but are not limited to: energy savings, improved air quality (Eco-friendly alternative mode of transportation reduces Green House Gases and Vehicle Miles Traveled), cost savings, greater mobility for impaired drivers, reduced congestion on freeways.
    - NEVs are ideally suited for short-local trips, therefore users will do more business/shop locally. NEVs can travel 20-30 miles on a single battery charge. On average, more than 75% of trips are three miles or less.
    - Used NEVs can be purchased for $3,000 to $5,000.
    - NEVs provide an alternative vehicle for those who age out of driving conventional high speed vehicles.
    - Low speed option prevents higher speed collisions compared to an automobile.
- Innovative aspect of including NEVs will bring positive attention to the ATC, resulting in project recognition to better compete for funding opportunities for projects that promote alternative forms of transportation.

Concerns:

- Increased cost of a wider project area footprint, additional $3,780,000.
- Only 145 registered electric vehicles.
- There is an unknown demand for NEVs. According to Joshua Cunningham, UC Davis Institute for Transportation Studies, car companies are working on producing City Electric Vehicles in 2010 (Reference Appendix H). These vehicles will travel 55 mph or more and can utilize freeways. Research suggests that these cars may reduce demand for NEVs.
- Although the project should qualify for grants set aside for non-auto modes, there are no known funding sources that are specific to NEVs.
- NEVs, being low speed, need safe roads to operate.
- Concerns about limited speed and range: NEVs are currently a “niche” vehicle, and with low-speeds topping out at 25mph, consumers may be more apt to purchase full-size vehicle platforms that are freeway capable, and capable of traveling more than 20 or 30 miles on a single battery charge.
- Purchase Decisions: There is a concern that NEV price is high ($7,000 to $12,000 depending on make and model), consumer needs to “want” electric vehicle benefits.

Incentives such as corridor access or free parking are “extra benefits” but will not likely drive purchase decision.

- Based on the online survey (reference **Appendix C**), 32% of respondents would not feel comfortable sharing the facility with NEVs.
- The jurisdictions believe it is possible to reduce the speed limit on a county road to accommodate NEVs rather than create a new route. Reducing the speed limit would require state legislation and would perhaps require funding for speed limit enforcement, but no funding for road improvement.

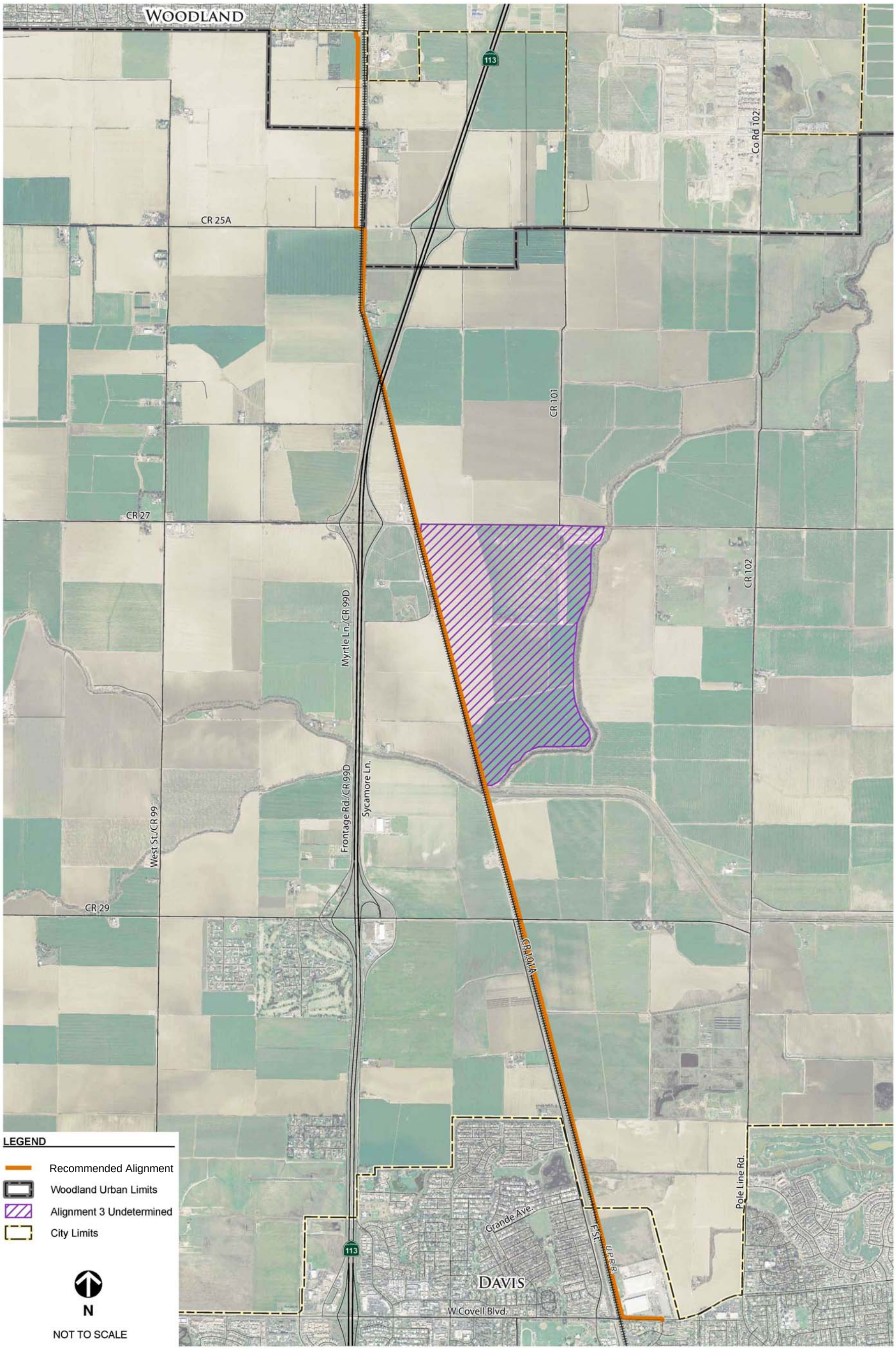


Figure 1-1: Recommended Alignment

1.4 Purpose

The purpose of the ATC Study is to update the 2001 Davis-Woodland Bikeway Feasibility Study and evaluate options for an alternative transportation corridor to connect the communities of Davis and Woodland through Yolo County. The long-term objective of this effort is the creation of an efficient, safe, and aesthetically pleasing alternative transportation corridor between Davis and Woodland that will accommodate bicyclists and pedestrians, and include low-speed electric vehicles and serve as a recreational and transportation amenity.

This ATC Study provides the following elements:

- Evaluation of existing conditions, including base mapping and GIS-based project mapping;
- Recommendations from the public outreach process, and a summary of survey data collected as a result of this process;
- A comparative analysis of three alternative alignments, including an evaluation matrix which examines each of the three alternatives in detail;
- An analysis of intermodal connectivity;
- Design considerations;
- Preliminary cost estimates;
- Recommendations to the general plan policies as they relate to long-term planning and the need for alternative modes of transportation.
- Provides evaluation of use of NEVs.

1.5 Study Area Overview and Description

On the following page is the study area map with the three Alternative Alignments (**Figure 1-2**). The study area is bounded to the south by Covell Boulevard in the City of Davis, to the west by the frontage roads (CR 99D, Myrtle Lane, Rose Lane), west of State Route 113, to the east by Pole Line Road (CR 102), and to the north by Woodland City Limits (CR 24A) (north of the Woodland Senior Center).

1.6 Project Team

The Project Team consists of Bennett Engineering Services (**BEN**|EN), Fehr & Peers Transportation Consultants, TCC Consulting, Kevan Shafizadeh, Ph.D., P.E., PTOE, and Environmental Science Associates (ESA).

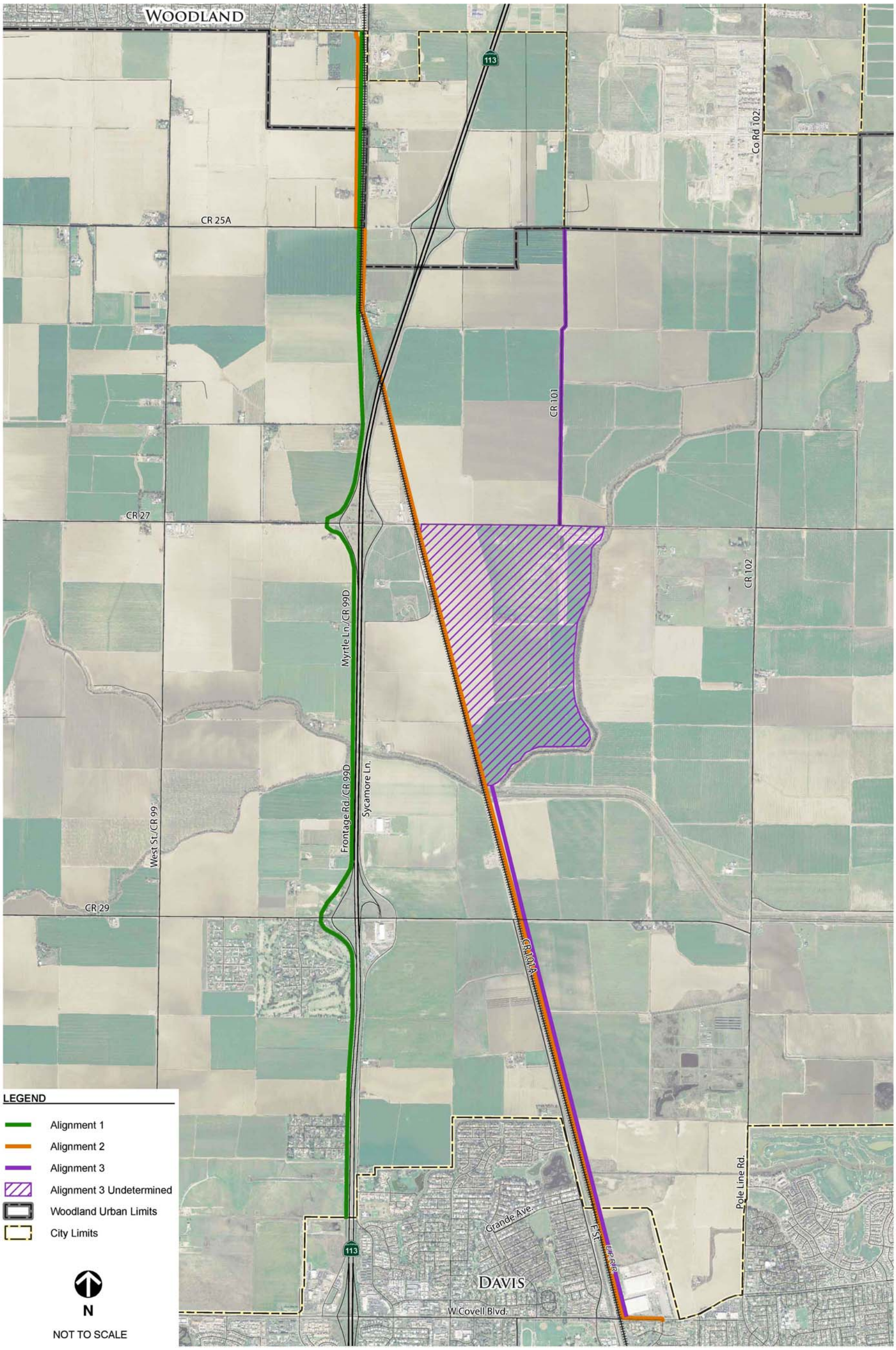


Figure 1-2: Alternative Alignments

2 Summary of Data Collection and Outreach

This section includes a summary of findings from the May 2009 Existing Conditions Memorandum, a summary of the public outreach meetings held in February and April 2009 including the relevant feedback received from project stakeholders, and results of the online survey conducted in March 2009.

2.1 Existing Conditions Memo

The May 2009 Existing Conditions Memorandum (ECM) was drafted by the Project Team and included a review and summary of the following documents:

- Summary of existing planning documents;
- Photo inventory of three alternative alignments;
- Assessment of alternative corridor demand;
- Comparative alternative transportation corridors around the country;
- GIS-based study area maps that examined right-of-way, drainage and watershed areas, railway alignments, approved development maps, and other relevant base maps;
- Environmental considerations included a reconnaissance-level evaluation of each alternative alignment focusing on key environmental resource topics including agricultural, biological, and cultural resources.

(ECM Cover page is included as **Appendix A**)

2.1.1 Summary of Existing Planning Documents

The following relevant planning documents were reviewed by the Project Team:

- Davis-Woodland Bikeway Study, 2001
- Yolo County General Plan, 2006
- County of Yolo Bicycle Transportation Plan, 2006
- City of Davis General Plan, 2001/2007
- City of Davis Comprehensive Bike Plan, 2006
- UC Davis Bicycle and Transit Network Study, 2009
- UC Davis Long-Range Development Plan, 2003
- City of Woodland General Plan, 2002
- City of Woodland Bikeway Plan, 2002
- SACOG Blueprint, 2004

Key recommendations and policies contained in these documents focused on the following:

- Improved air quality through encouraging alternative modes of transportation.
- Increased alternative modes of transportation by adding infrastructure and planning for new bikeways in new developments.
- Identified needs of bicyclists and encourage bicycle travel for both transportation and recreation.
- Growth within and immediately adjoining existing towns. Identified new alternative transportation corridors and connections that are necessary to expand facilities.

2.1.2 Photo Inventory

Photographs along each alternative alignment were compiled by the Project Team using Google™ Street View and other available public resources and included in the ECM. Additional photos were taken at key vantage points during several site visits. The photo inventory provided an important street-level survey view along each of the three proposed alternative alignments to provide perspective on some of the roadway conditions and dimensions, the impacts to properties along the corridor, interferences such as fencing, and other man-made and natural surface features.

The 32 page insert in the ECM includes aerials with numbered locations and subsequent numbered street-view photos to provide the reader with a snap-shot realistic field perspective. It enables the reader to visually locate some of the opportunities and constraints that are present along each of the alignments.

2.1.3 Assessment of Alternative Transportation Corridor Demand

Fehr & Peers completed a Preliminary Demand Assessment Technical Memorandum dated March 24, 2009 (included in Appendix A of the ECM). Fehr & Peers reviewed various data sources to understand existing travel trends between Davis and Woodland to estimate bicycle and NEV demand within the study area. An online survey was conducted as part of the data gathering and public outreach efforts, in order to collect data and further assess the demand. The results of this survey are shown in **Appendix C.**

2.1.4 Alternative Transportation Corridors

The ECM includes a summary of comparative alternative transportation corridor efforts around the country. The California communities that were researched include, but are not limited to, the City of Lincoln, City of Rocklin, City of Palm Desert, and Rancho Mission Viejo, all of which have established bicycle, golf cart and NEV circulation elements and infrastructure. In addition, Peachtree City, Georgia has an established multi-use path system (circa 1950's) that supports pedestrian, bicycle, golf cart, and NEV usage.

The review of these communities provided the Project Team with a better understanding of the types of infrastructure that is being built. It also provides insight into the types of legislative pursuits, funding opportunities, and design elements, all of which are important considerations when determining the feasibility of the Project alignments.

2.1.5 GIS-Based Aerial Maps

The GIS-based aerial maps included in the ECM were developed by the Project Team to help better determine project impacts and existing conditions. They include land use, places of interest, and existing traffic data.

The Land Use exhibit shows the alternative alignment project areas being predominantly adjacent to agricultural land in Yolo County (between the Cities of Davis and Woodland). Places of Interest are also represented on this map and key destinations are listed.

Average daily traffic volumes are shown on Figure 6-2 of the ECM. Traffic volume is an important analysis to perform because bikes and pedestrians do not feel safe along roadways that have a high volume of vehicle traffic.

The Adjacent Parcel exhibit represents the parcels (including boundary lines and parcel numbers) impacted by each alignment within the study area.

2.1.6 Environmental Considerations

Environmental Science Associates, Inc. (ESA) technical staff conducted a reconnaissance-level evaluation of each alternative alignment focusing on key environmental resource topics including agricultural, biological, and cultural resources.

Included in Section 7 of the ECM is a summary of the existing biological, agricultural, and hydrologic (focusing on flood zones) conditions within the project Study Area.

2.2 Community Kick-off Meeting Feedback

The community kickoff meeting took place on February 23, 2009 at the Woodland Community Center. The meeting included a brief presentation from Yolo County and consultant Project Team, followed by a group discussion and breakout session.

The group (made up of approximately 80 residents and stakeholders) was instructed to focus on big-picture policy questions, project advantages, likes, considerations, and concerns such as liability, cost, and design concerns. Meeting notes were compiled and were posted on the Yolo County website. Listed below are some key summary points:

Key project advantages and positive comments include:

- A dedicated corridor that will "bridge" the cities of Davis and Woodland.
- Multi-jurisdictional coordination [between Agencies Yolo County-Woodland-Davis].
- The addition of low-speed electric vehicles will reduce air pollution and establish an "alternative vehicle niche".
- Having a dedicated corridor will:
  - Improve SAFETY for bicyclists
  - Encourage bicycling and promote fitness/healthy lifestyle
  - Provide an alternative to driving thereby reducing congestion on roads
  - Provide opportunity to appreciate agriculture, vegetation & wildlife. Educational rides - school field trip destinations
- There will be some economic benefits such as "Eco-tourism." Bike shops will benefit - more rentals of bikes and potential NEV rentals.
- There is a potential for regional and national recognition for having a first of its kind "NEV Highway." May provide access to more State and Federal Funding opportunities.

Key project disadvantages and negative concerns include:

- Aerial spraying of pesticides along the corridor will impact the bicyclists. This project could also restrict farmers from using aerial spraying, and also impact general farm operations.

- Safety concerns with shared use of facilities along portions of the routes. To avoid potential conflicts, a separate facility is wanted.
- Open ditches along farmland
- Safety concerns with crossings at certain county roads (CR25, CR27, CR29).
- Access points and connections into Woodland are not defined
- Unsure if demand for route is enough to offset costs/impacts. General cost concerns.
- Potential environmental impacts (Willow Slough, trees, wildlife).
- Landowners are concerned about trespassing/vandalism of their properties. The facilities will need policing; enforcement/ordinance signage.
- Lack of amenities such as rest rooms, charging stations, proper lighting.

Utilizing the questions and feedback gathered from this meeting, a list of Frequently Asked Questions (FAQs) was compiled and published on the Yolo County website, available at: http://www.yolocounty.org/Index.aspx?page=1667.

2.3 Neighborhood Meeting #2 Feedback

The second community meeting took place on April 27, 2009 at the Veteran Memorial Center in Davis. The meeting included a presentation from the City of Davis and consultant Project Team, followed by brief questions and answers, and a final breakout session.

The group (approximately 35 residents and stakeholders) was invited to visit the tables in the back of the room to provide specific input on the three alternative alignments (reference **Figure 1-2**), cross-sections (reference **Figures 5-2-1 through 5-2-5**), existing conditions, and environmental impacts.

The community provided the following feedback:

Alignment 1

Participants felt this alignment would be much noisier because it is close to SR113, and would have no aesthetic value. Participants felt it would be more difficult to access the beginning (southern portion) of this alignment, due to traffic concerns along Covell Boulevard. Participants prefer an off-road path, instead of traveling along frontage roads and adjacent to vehicle traffic. They felt traveling on roadways adjacent to local traffic would be less safe than an off-road path even if shared with an electric vehicle. Other members of the community (adjacent land owners) were in opposition to this option citing increased traffic, potential for vandalism and an unwillingness to sell.

Alignment 2

The general consensus was that this alignment seemed to have more aesthetic value and would be a quieter path compared to Alignment 1. Participants made observations that the end points are in the best locations for both cities - most direct connection to and from central Davis & Woodland. Participants also felt this alignment would make the most sense for commuting to and from Davis & Woodland and would be more accessible by majority of the population in Davis & Woodland. It was also envisioned to be a much safer alternative than Alignment 1 since it provides an off-road option throughout the corridor. Most commented that they would like to see the path on one side of the railroad tracks throughout the corridor rather than having to deal with potentially crossing the railroad tracks and/or sharing the roadway with county road traffic.

Alignment 3

Since this alignment is longer than the other two, some participants voiced concerns about the added cost of this alternative. Some participants did not prefer the location of this alignment, because it connects to east part of Woodland and would be more difficult to access other parts of the City. One County resident expressed concerns that this alignment could be aligned close enough to equestrian paths that would scare the horses. Others felt the added traffic from the future Spring Lake development and the proximity to existing or planned schools would make this alignment undesirable.

One participant saw the need to connect to the future Spring Lake Community but suggested a modification to Alignment 3 that would be combined with Alignment 2. The idea was to design and seek funding for Alignment 2 with an option to construct, in phases, a route starting from County Road 27 or just prior to State Route 113 to the proposed Spring Lake community.

Landowner Issues

Landowner concerns were similar to those noted in the first community meeting - including impacts to farming activities, animals, aerial pesticide spraying, trespassing, right-of-way impacts, and impacts to sensitive wildlife habitats. Landowners felt the greatest social and environmental impacts would result from Alignment 1.

Residents commented that tomato trucks frequently travel along the west side of Frontage Road from County Road 29 to north of County Road 27 (adjacent to Alignment 1). They felt that the speed of the trucks in this area, and the debris they leave along the roadways can be significant.

Cross-Sections

Five cross-section diagrams were provided for residents to review. Below are summaries of comments collected from residents at the meeting. Cross-section exhibits are located in Section 5, Figures 5-2-1 through 5-2-5.

1. **Class I – Off-Road Bike Path**

   A bike path only configuration with a 10-foot paved surface allowing for a two-way bike use. Pedestrians are also permitted to walk on the path.

   Most residents agreed that a complete off-road bike path is preferred over sharing the road with fast-moving vehicles.

2. **Class I – Off-Road Shared Bike/NEV Path (Constrained R/W)**

   A two-way *shared* path with 16-foot paved surface that allows for shared bike and NEV use and a 4-foot pedestrian path.

   Similar to the above Class I Off-Road Bike path, the community provided positive and negative comments. In general, an off-road path is preferred but some thought the added cost to provide the width to accommodate electric vehicles may not be justified if the demand for alternative transportation is low.

   Participants noticed the advantages of a shared, wider facility that would allow for side-by-side bike use when electric vehicles are not present. Some individuals perceived this

cross section as having a potential for being too narrow when all modes of travel are present at once. Another general comment was related to NEVs passing bicyclists. It was felt that if NEVs are silent-running, then bicyclists would not hear them approaching from behind unless they provided an audible warning.

3. **Class I – Off-Road Two-Way Bike/NEV Path (Unconstrained R/W)**

   NEVs separated from bikes. NEV lanes would be approximately 14-foot wide to allow for two-way NEV use. A delineator at the center line would separate NEVs from bicycles. The 8- foot bike lanes would allow for two-way bike use with a separate 4-foot pedestrian path.

   One participant commented that this configuration would be bad, confusing/unsafe, but did not elaborate further on why that opinion was made. Another participant commented that this configuration might be safer if NEVs are separated from bicycles via a low inexpensive barrier. Some felt that it would be a much more expensive option especially if the demand did not justify the separation of the modes of transportation.

4. **Class II – On-Street Bike Lane**

   A typical on-street 4-foot bike lane on either side of two-way vehicle traffic.

   Some felt that a bike lane would be "better than nothing."

5. **Class II – On -Street Bike/NEV Lane**

   This cross section would exist on streets over 35mph. The cross section is an on-street 7-foot bike/NEV shared lane on either side of two-way vehicle traffic.

   There was a general perception this configuration was unsafe. The concern was the 7-foot wide shared lane was too narrow, especially next to vehicle traffic.

2.4 Stakeholder Feedback

Stakeholders include groups and organizations affected both directly and indirectly by the project alternatives. Their feedback is critical to the final alternative evaluation.

2.4.1 Bicycle Groups

Preliminary discussions were held with representatives of the Davis Bike Club, and Davis Bicycles!. Overall, there was support of the Alternative Transportation Corridor concepts presented to them, and they supported linking the two cities via Class I paths. They preferred a separate bike path, rather than a shared-use path, but agreed that building any type infrastructure is better than none at all. This is consistent with recent feedback from bicyclists present at both community meetings.

Recent meetings have not yet been held with local bicycle groups by the jurisdictions. Should the ATC project progress to the next level of development, the Project Team recommends facilitating further discussions to garner additional input.

In the *online survey* conducted February-April 2009, many bicyclists submitted comments, and they are listed in **Appendix C**, Item #30.

2.4.2 Yolo County Department of Agriculture

Discussions took place between the County of Yolo, the Project Team, and Yolo County Agriculture Commissioner, Rick Landon on May 5th, 2009. Topics discussed included requirements by the Yolo County Department of Agriculture (Ag Commission) if an Alternative Transportation Corridor was constructed adjacent to farmland in Yolo County.

Spraying of any given crop usually occurs a couple of times a year per parcel, and it mostly occurs during the morning hours. The duration of spraying is typically an hour. Parcels within the 500-foot buffer of city limits are not permitted to use aerial applications.

Sprayers must notify the Ag Commission if a toxic pesticide is being applied, and the grower is required to submit a Notice of Intent. A twenty-four (24) hour notice prior to the application is required. If the chemical is a nonrestrictive/toxic chemical type, then no notice of spraying is required. Growers are required to submit a Use Report by the 10th of the month specifying the spraying activities that took place the prior month. The Ag Commission does not keep a list of growers that spray or a schedule, so it makes it difficult to know when all aerial spraying activities will occur.

Should an Alternative Transportation Corridor facility be designed and constructed, consider the following:

1. The corridor may need to be closed during spraying times which will require close coordination with growers to determine their spraying schedule. Closing the facility could become the responsibility of a joint partnership with bicycle groups/City/County staff to ensure path users stay off the facility during spraying times. In addition, Yolo County may require posting of signs regarding the risk of spraying/right to farm.
2. The corridor may require a 500-foot buffer on either side of the facility and restrict some areas to manual spraying.

2.4.3 Yolo County Farm Bureau

The Cities of Davis and Woodland, and Yolo County met with the Yolo County Farm Bureau and other key stakeholders in July 2009 to discuss the Alternative Transportation Corridor. The meeting summary is included in its entirety as **Appendix D**. According to the meeting summary, the group shared perspectives and concerns about the movement of farm equipment, pesticide application, and impacts on property and wildlife.

The group recommended a 500 foot buffer along the corridor, possibly via purchase of the property or via purchase of an easement with restrictions. They also recommended incentive programs for impacted landowners to offset impacts and to offset increased exposure to liability. Also as an incentive to impacted landowners, consider flood control/water conveyance, but theYolo County Flood Control & Water Conservation District would have to be consulted.

2.4.4 California Northern Railroad (CNRR) / Union Pacific Railroad (UPRR)

The railroad tracks belonging to the California Northern Railroad (CNRR) run between and into the cities of Woodland and Davis, connecting with other track alignments in both cities. CNRR currently uses this route to move goods between the cities and to points beyond.

The alignment of these tracks, should CNRR abandon operations along this route, could provide right-of-way for an alternative transportation mode system that includes walking, bicycling, and NEVs. The alignment may be a candidate for this conversion through the state Rails-to-Trails Program that provides funding to acquire abandon railroad right-of-way for alternative transportation modes.

Although our brief informal conversations with railroad representatives makes it seem unlikely that the operations along this alignment will be abandoned, it is recommended that the City of Davis (or Woodland, Davis and Yolo County jointly) formally request information regarding future plans and operations along this route.

More recent discussions with the railroad representatives revealed plans to abandon the railroad tracks five to ten years into the future. Purchasing right of way or obtaining an easement from the railroad is a lengthy process and not recommended if the jurisdictions want to explore starting the next phase of this project soon.

It is however, recommended that measures be taken and opportunities be explored to take advantage of the existing tracks for transportation alternatives linking the communities of Davis and Woodland.

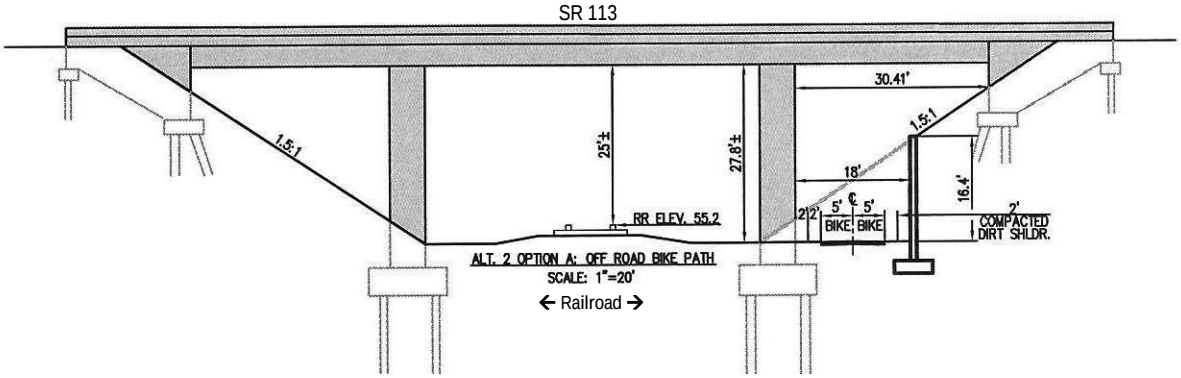
2.4.5 California Department of Transportation

Discussions with the Department of Transportation (Caltrans) District 3 Planning staff resulted in positive feedback regarding design considerations, opportunities and constraints. The team was informed that per Director's policies, Caltrans staff is encouraged to assist local agencies to plan and construct projects that incorporate non-auto modes and help to reduce greenhouse gases (GHG). This project is a great example of a project that fits the goals and objectives that Caltrans, the State of California, and the nation are encouraging.

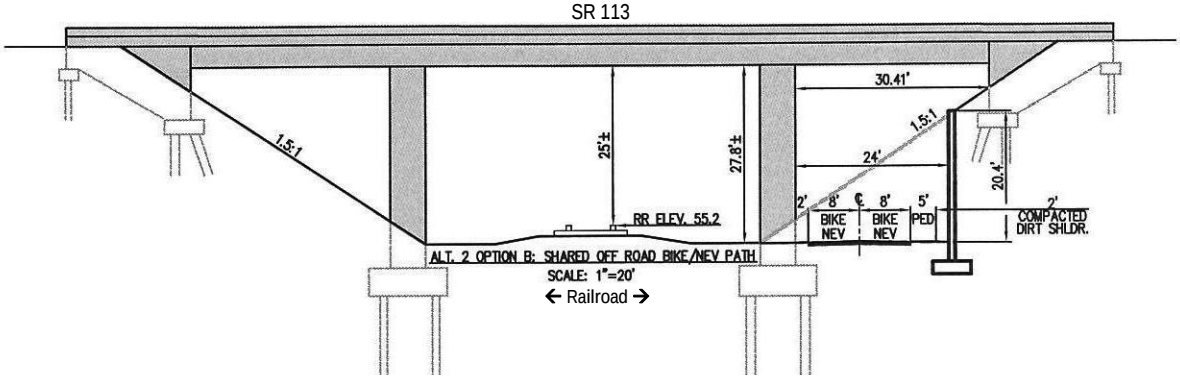
Caltrans Approvals

This project will require Caltrans approvals for encroachment permits within Caltrans right of way, requesting authorization if federal funds are used, and approvals for usage of special signage and striping if NEVs become an essential component of the project. In addition, an encroachment permit from Caltrans is required for this facility if work within the Caltrans right-of-way is proposed.

Refer to **Figure 2-1** below, representing a typical cross-section of the crossing under State Route 113. Caltrans has provided positive feedback to construct the alignment as shown within Caltrans right-of-way under the State Route 113 overhead.



Typical Cross-section for Bike-only Path



Typical Cross-section for Bike/NEV Path

Figure 2-1: Cross-sections

Caltrans currently has no geometric standards for NEV paths. The 16' path width appears to be adequate for NEVs and bikes, in addition to the 5' pedestrian path.

Should the design include excavating the existing abutment fill to build a path according to this cross-section, Caltrans will need to review and approve the project plans.

Caltrans Bicycle Transportation Account (BTA) Funding

The Project Team consulted with Caltrans' Bicycle Program Manager regarding this type of project eligibility for possible BTA Funding. Caltrans offered the following:

- The project (even if it includes NEVs) would not be precluded from funding.
- The BTA review committee would consider the function and design of path including traffic volumes, street crossings, and functionality.
- It would be up to the local jurisdictions to decide the policies of usage of the path beyond bicycle use only.

- The project would qualify for the BTA funding as long as it meets minimum standards for Class I bike paths.

2.4.6 Law Enforcement

The Yolo County Sheriff's Department and other local law enforcement agencies would play a vital role in policing the corridor. Periodic patrols, distribution of law and policy information, such as brochures for path users, and working with residents and stakeholders to ensure enforcement and safety along the corridor will be paramount to the success of this project. The Project Team has contacted the Yolo County Sherriff's Department to request a summary of any concerns they might have, and gain insight as to how they might approach policing the corridor. This summary is pending, and their response will be provided in a memorandum.

2.4.7 Land Stakeholders

During the course of community meetings and in working with staff and elected officials from Yolo County and the Cities of Woodland and Davis, it has been suggested that a Class I off-road facility would be preferred along the corridor to the greatest extent possible. Among the several challenges with a Class I off-road design is the acquisition of right-of-way for the project.

Two land developers, North Davis Land Company and Lewis Planned Communities own property to the east of CNRR from East Covell Boulevard and 'F' Street north to Willow Slough where the slough crosses the UPRR tracks - a distance of approximately 2.7 miles. Both developers have sent letters stating their interest in working with the jurisdictions in the future to secure approximately 2.7 miles of Class I combination bike/walk/NEV right-of-way paralleling the Union Pacific tracks along this alignment.

2.5 Results of Online Survey

An online survey was conducted that included approximately 300 respondents from Yolo County, City of Woodland, and City of Davis. The results of this online survey are shown in **Appendix C**.

3 Alignment Connectivity

Each of the three study alignments were evaluated to determine the ease with which major land uses and inter-modal destinations could be reached by bicycle and/or NEV. It is important that users of the multi-modal facility have opportunities to access activity destinations, other modes of transportation such as transit or automobiles, and find a place to safely park.

As **Figure 3-1**, **Land Use** map indicates, the majority of the adjacent land along the alignments between the Cities of Davis and Woodland is agricultural. Other land uses include parks and open space, residential (low to medium density) and industrial land use. Major retail developments, employment centers and community resources are shown to indicate the relative proximity of each to the proposed corridor alignments. The following are considered key regional destinations that provide desired activities and modal-integrating opportunities within the study area:

<u>Woodland</u>

- Downtown Woodland
- Yolo County Fairgrounds
- County Fair Mall
- Woodland Sports Park and Senior Center
- Woodland Community College
- Gateway Retail Center
- Pioneer High School

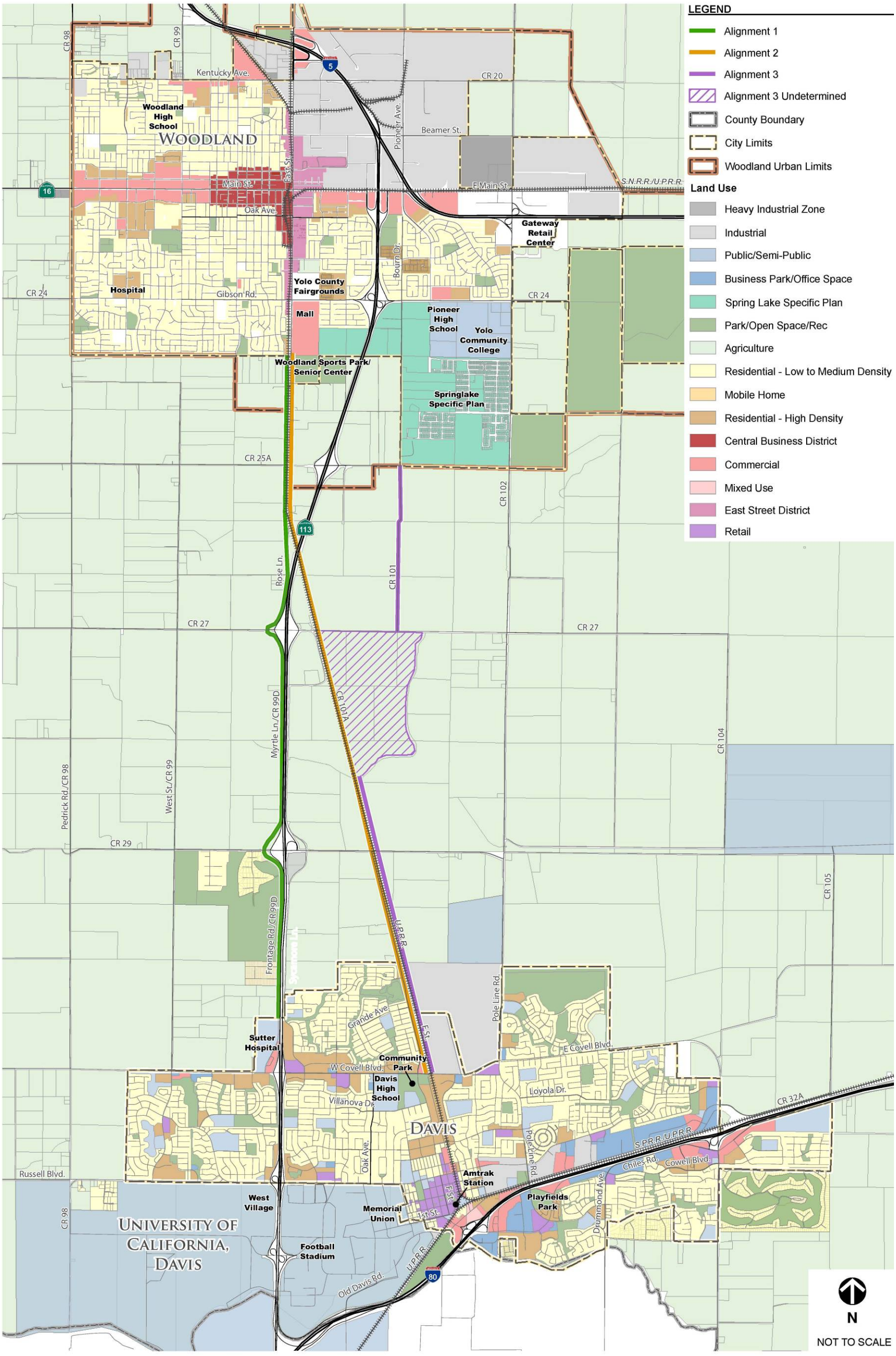
<u>Davis</u>

- Downtown Davis
- Explorit Science Center
- US Bicycling Hall of Fame Museum
- Central Park / Farmers Market
- University of California, Davis
- Amtrak Station
- Sutter Hospital
- Wildhorse Golf Course
- Davis Community Park
- Davis High School
- Playfields Park

<u>Yolo County</u>

- Davis Golf Course
- Farmlands
- Various Riparian Habitats

In order to compare how well each of the alignments would serve key destinations, an analysis of each alignment terminus was conducted. Both Alignments 1 and 2 terminate on the north near East Street south of Gibson Road. Alignment 3 terminates near County Road 101 within the proposed Spring Lake development. On the south, Alignments 2 and 3 terminate north of Covell Blvd. at J Street. Alignment 1 ends along County Road 99D north of Covell Blvd.



*This map represents Land Use only. See Figure 1-2 for updated Alignments.

Figure 3-1: Land Use Map

Figures 3-2 and 3-3 show the **Woodland and Davis Corridor Connections and Bicycle Coverage by Travel Time.** The shaded areas indicate travel time (5, 10, 15 and 20 minutes) from the connection points, to the surrounding areas. This assessment was made by comparing travel times (assuming an average travel speed of 12 miles per hour) along existing and planned roadway and bicycle networks.

Alignment 2 offers the most destination opportunities and the least amount of travel time.

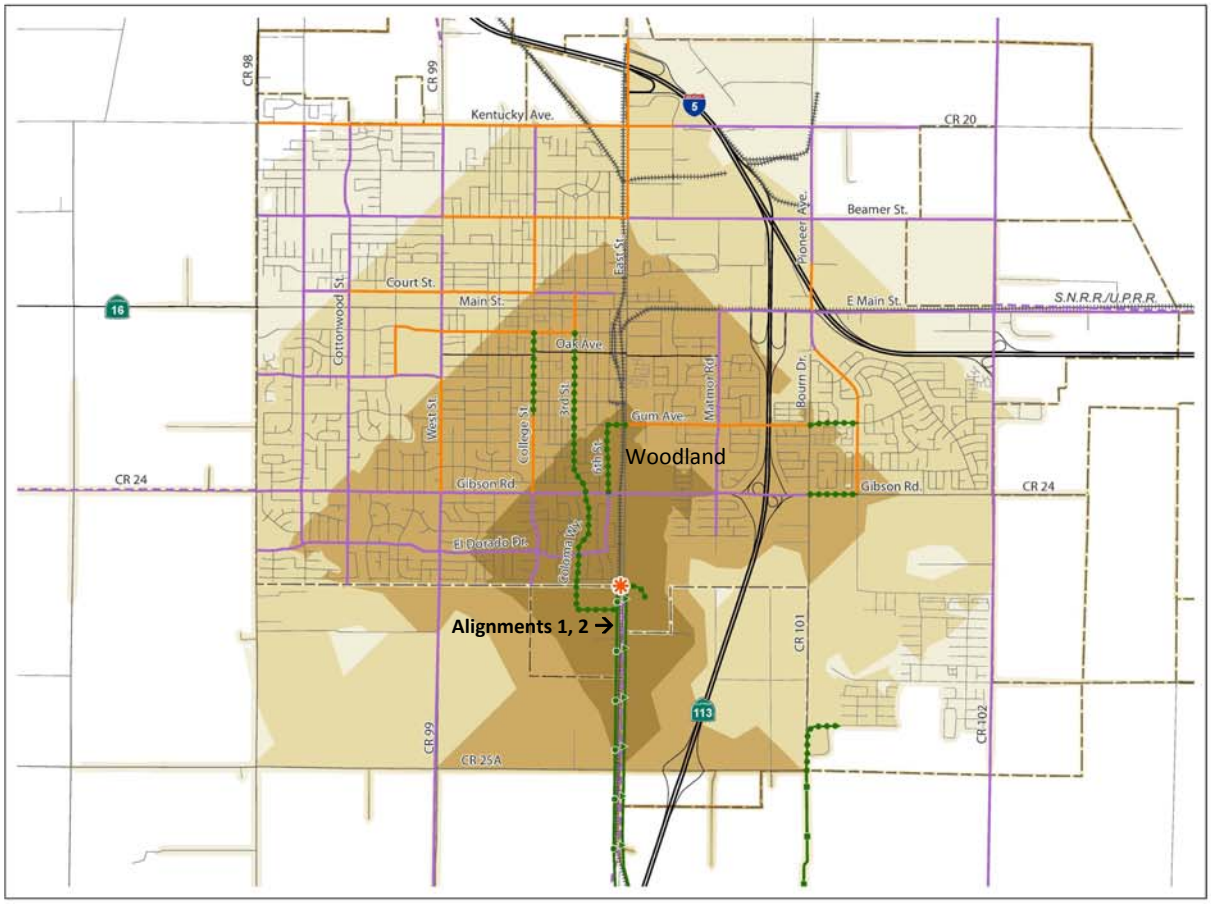
3.1 Key Connection Points

The City of Davis connection points for Alignments 2 and 3 (see Figure 5-2) is at East Covell Blvd. & J Street. It is important to note that the majority of streets in the City of Davis have 25 mph speed limits, and most of Covell Blvd. is 35 mph. Since NEVs are permitted for use on city streets posted 35mph and under, they can easily access the corridor entrance. Additionally, Covell Blvd. has bike lanes.

The connection point to the City of Woodland is north of CR24A, at 6th Street (see Figure 5-10). The connection to the City of Woodland's existing Bike Plan route is located at 6th Street and El Dorado Drive. From this point, bicyclists can navigate to key destination points throughout the City. Also, most City streets are posted 35 mph or under.

Key connection points were chosen based upon the following:

- Feedback from the community meetings - Participants felt Alignment 2 would make the most sense for commuting to and from the City of Davis and the City of Woodland, and would be more accessible by the majority of the population.
- Access to existing bike paths and city bike plans.
- Convenience in travel time to key destinations.



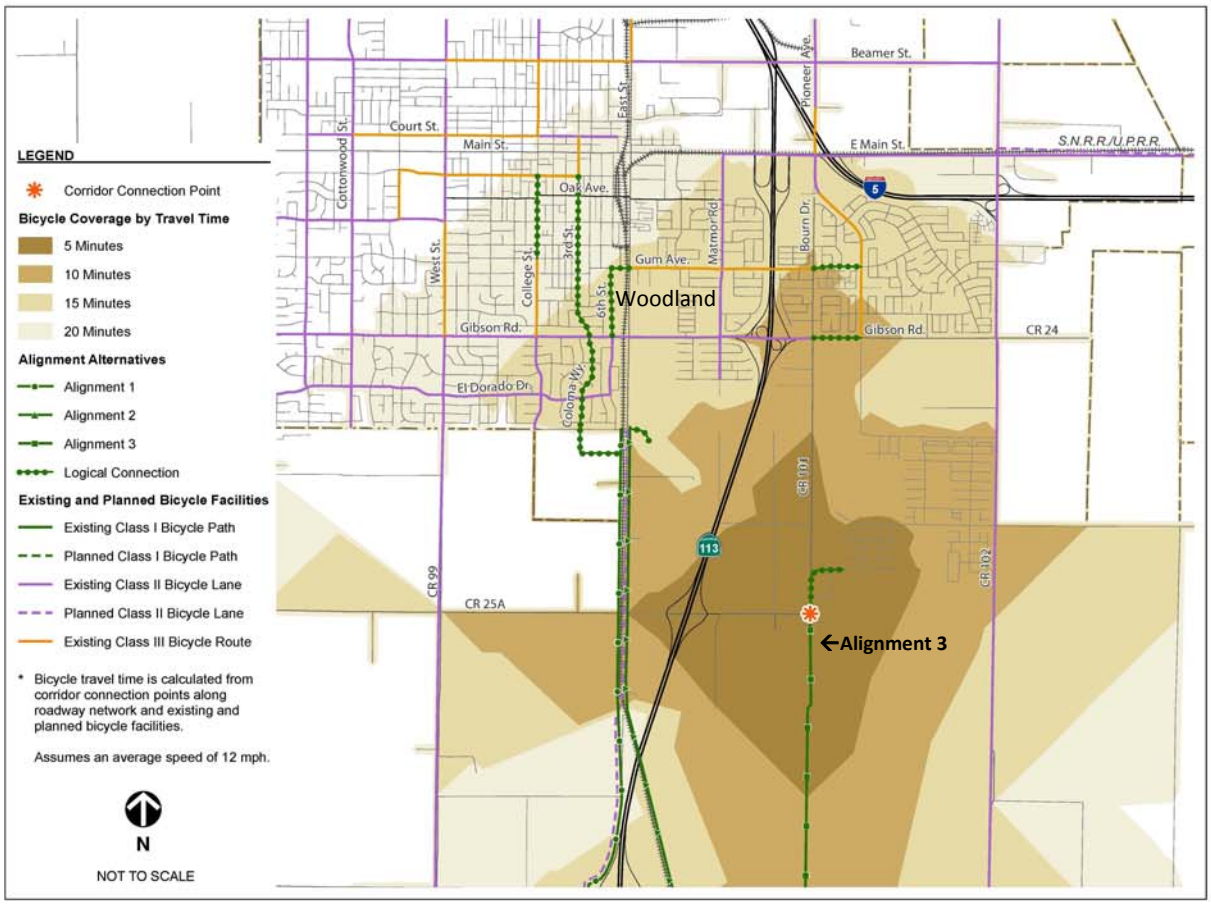


Figure 3-2: Woodland Corridor Connection and Bicycle Coverage by Travel Time

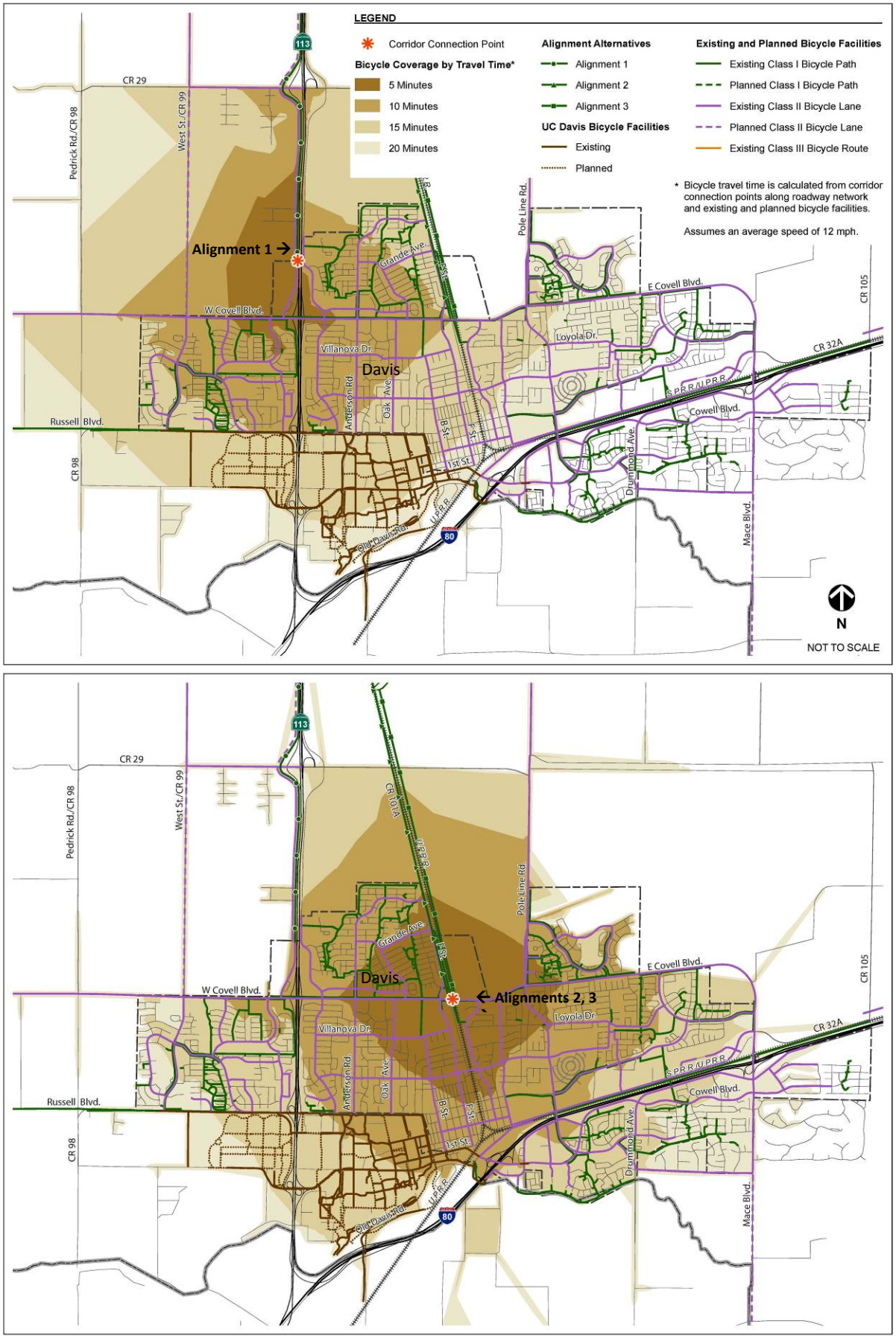


Figure 3-3: Davis Corridor Connections and Bicycle Coverage by Travel Time

4 Long Range Planning

The development of goals and policies is an important early step in the study process because they provide direction and guidance during the evaluation of specific routes and alignments. The Project Team focused on the existing goals and policies from the City of Davis General Plan, City of Woodland General Plan, Yolo County Bikeways Master Plan, and Yolo County General Plan.

In addition, the Project Team utilized planning and policy documents from national organizations to help provide direction and guidance. Important references for multi-use trail/path facilities include: the National Recreation & Park Association, American Planning Association, Rails-to-Trails Conservancy, Bicycle Federation of America, and Institute of Transportation Engineers.

Key policy issues and ATC planning analysis focused on implementation, funding, and ATC conflicts between various users such as bicyclists, pedestrians, rollerbladers, and other non-motorized modes.

4.1 Policy Analysis

The jurisdictions' policies share common themes for improved transportation planning such as:

- Improve air quality by encouraging use of alternative modes of transportation.
- Increase alternative modes of transportation by adding infrastructure and planning for new bikeways in new developments.
- Identify the needs of bicyclists and encourage bicycle travel for both transportation and recreation.
- Grow within and immediately adjoining existing towns. Identify new alternative transportation corridors and connections that are necessary to expand facilities.

This project is consistent with the goals and objectives of the existing planning documents.

4.2 Recommendations for Long Range Planning

As we enter into the next millennia, issues related to air quality, greenhouse gases, transit, traffic congestion, and community design have become important topics for the state as a whole, but in particular for cities and counties. Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, was passed to implement air pollution reduction measures, and direct the State Air Resources Board to coordinate with state agencies and other stakeholders in implementing the bill's provisions requiring California to reduce GHG emissions to 1990 levels by 2020. Senate Bill (SB) 375 provides direction for guidelines on transportation planning, travel demand models, sustainable communities strategy, and environmental review. Local jurisdictions will be required to execute local planning efforts and prepare general plans with community design and transportation elements that will fit into the Regional Transportation Plans (RTP) and the Metropolitan Transportation Plan (MTP). At the Federal level, Complete Streets design is being considered for addition to federal transportation guidelines to address greenhouse gas emissions, and will certainly affect future planning efforts at the local level.

Many cities and counties are migrating toward more compact development and smart neighborhood design features that have traditionally included examining the alternative modes of transportation that include walking, bicycling and transit. While these alternative

modes help move communities toward improved air quality and reduced GHG, policies and design criteria should be reviewed and strengthened to promote the use of non-auto modes, including Neighborhood Electric Vehicles (NEVs).

4.3 The Future of NEVs

In 1994, UC Davis Institute of Transportation Studies held a workshop and posted hosted a Neighborhood Electric Vehicle Workshop, and published the proceedings in a 167 page document (available online at: http://pubs.its.ucdavis.edu/publication_detail.php?id=763). In the proceedings (page 10), the following is stated under the summary conclusion:

> "Two decades of research on neighborhood vehicles by William Garrison, Albert Sobey, Paul MacCready, ITS – Davis researchers, and many others suggests that NEVs could provide numerous direct and synergistic benefits."

The summary goes on to list the benefits which include pollution reduction, reducing demand on transportation infrastructure, and creating more 'livable' communities. Also included in the proceedings of this workshop is a statement from Professor William Garrison of the University of California at Berkeley, who brought to the session 20 years of experience in researching the potential use of neighborhood vehicles. Professor Garrison suggested that an underlying problem has been the *elusiveness of champions* for small vehicles to facilitate their use. He hopes that highway agencies will be the leaders, and the potential that NEVs offer will only be realized through cooperation between vehicle suppliers, infrastructure providers, and regulatory agencies.

According to a 2006 article by journalist Howard Lovy[1], the current and potential market for NEVs can vary according to the dreams or experience of the manufacturer. Lovy states, "The future of NEVs does not depend so much on technological innovation. It's more about marketing." Scott Thornton, Kurrent NEV manufacturer believes the market will be able to support the sale of 15,000 NEVs a year [nationally], which he hopes to be able to produce sometime after 2010. Lawrence Oswald, CEO of Global Electric Motorcars LLC, the DaimlerChrysler subsidiary that manufactures the market-leading GEM cars believes the market can support 7,000 per year.

The Electric Drive Transportation Association, an industry group for plug-in car makers, estimates that there have been about 60,000 low-speed electric cars sold in America. Of those, 40,000 are GEM cars. Current makers of NEVs include, but are not limited to: Global Electric Motorcars (GEM cars), American Electric Vehicle Company (Kurrent), ZENN Motor Company, Columbia ParCar Corp., and Miles Electric Vehicles.

NEVs currently fill a niche market. Buyers include seniors who may have "aged" out of driving conventional vehicles, and other individuals who have physical challenges and are unable to ride a bike or walk long distances. There is also the new generation of "green" consumers who desire a zero-emission vehicle to reduce their carbon footprint. And finally, there are residents who make the majority of trips within their local community, travel on residential-speed roadways, and desire a more economical mode of transportation to the school or grocery store.

[1] Lovy, Howard, (12/14/2006), Oakland Business Review, *Will Ferndale electric car maker click or short circuit?,* < http://www.mlive.com/mbusinessreview/oak/index.ssf?/mbusinessreview/oak/stories/20061214_electriccar.html >, Accessed 8/18/09.

What may have been true in the past, may also be true today, however a different perspective was presented to the jurisdictions by Joshua Cunningham of the University of Davis Institute of Transportation Studies. Mr. Cunningham's September 2008 presentation, *Research Insights for NEVs on a Davis-Woodland low speed corridor,* has been included, in its entirety, as Appendix H. The following is a summary of Mr. Cunningham's key points:

- A comparison of Electric Vehicle Categories & Products – NEVs compared to City EVs.
    - City EVs are small vehicle platform, but highway speed capable
    - Recent automotive announcements: list of three manufacturers who have City EV's production beginning in 2010.
- Market Perspectives on NEVs
    - Current Incentives in CA: PG&E; CARB rebates; possible future incentives.
    - Vehicle usage (Davis, Woodland cases)
        - NEVs, being low speed, need safe roads to operate
        - NEV range – 2/3 of range needed in Davis-Woodland commute alone, only leaves 10 miles for in Davis & Woodland.
        - City EVs – perfect for within city and short commutes (Davis-Woodland); safer on wider range of roads
    - Purchase Decisions
        - Vehicle price is high, consumer needs to "want" EV benefits (zero emissions, quiet, no gasoline, etc.)
        - Incentives such as LSV corridor access, or free parking, are "extra benefits" but will not likely drive purchase decisions
- What technology is coming next?
  All these options are on full size vehicle platforms
    - Cheaper, better hybrids (HEVs)
        - Honda, Toyota, others unveiling new cars in 2009.
    - Plug-in HEVs (PHEVs)
        - Toyota & GM plan production in 2010/2011
        - Basically an HEV but with ability to plug in to grid
    - Fuel Cell Vehicles
        - Production vehicles will emerge in 2015 at the earliest

5 Design Considerations

The Project Team evaluated several elements of design, which include the following: intersection design details, signage and striping, charging stations and amenities, cross sections, and shared use of the facility.

5.1 Design Details

5.1.1 Intersection Crossing and Bridge Details

Below is a typical bridge cross-section design for Willow Slough. Figure 5-1 illustrates a cross section for the Bike/NEV option. The bike only option would provide for a minimum of ten (10) foot-wide clear path, with 2-foot wide shoulders on either side of the path.

On the following pages, example roadway crossing details are provided (**Figure 5-2** through **Figure 5-10**) that could be incorporated into the design of the corridor at various intersections. **Insets are shown for the recommended Alternative 2.**

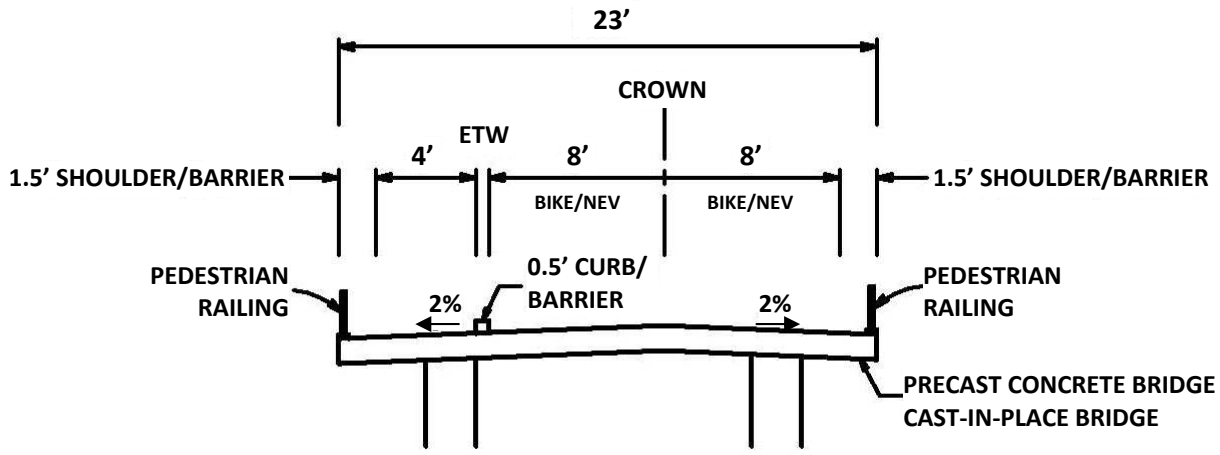


Figure 5-1: Typical Bridge Section across Willow Slough

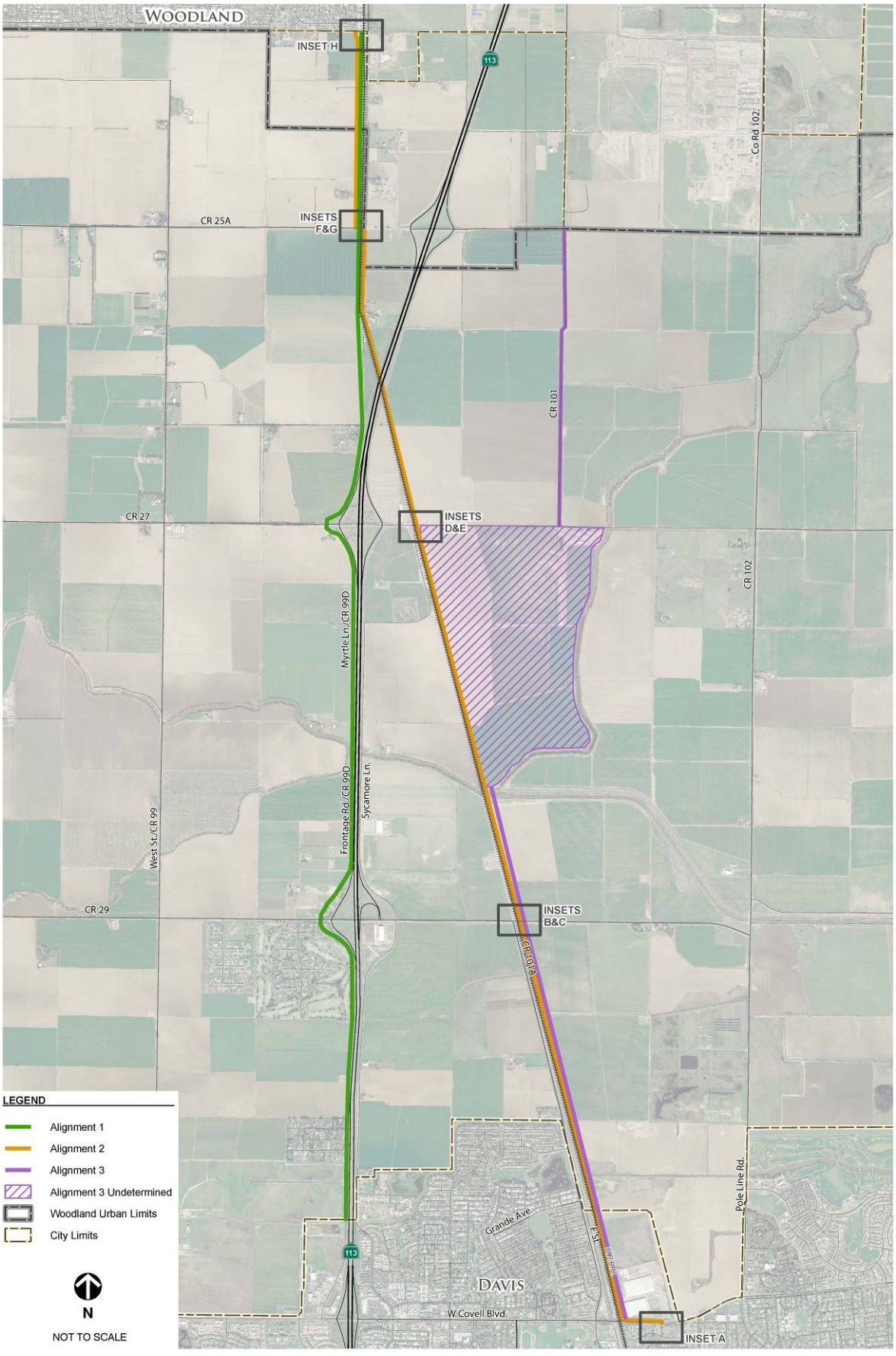


Figure 5-2: Inset Key

Figure 5-3: Inset A Draft ATC Crossing

Figure 5-4: Inset B Draft ATC Crossing

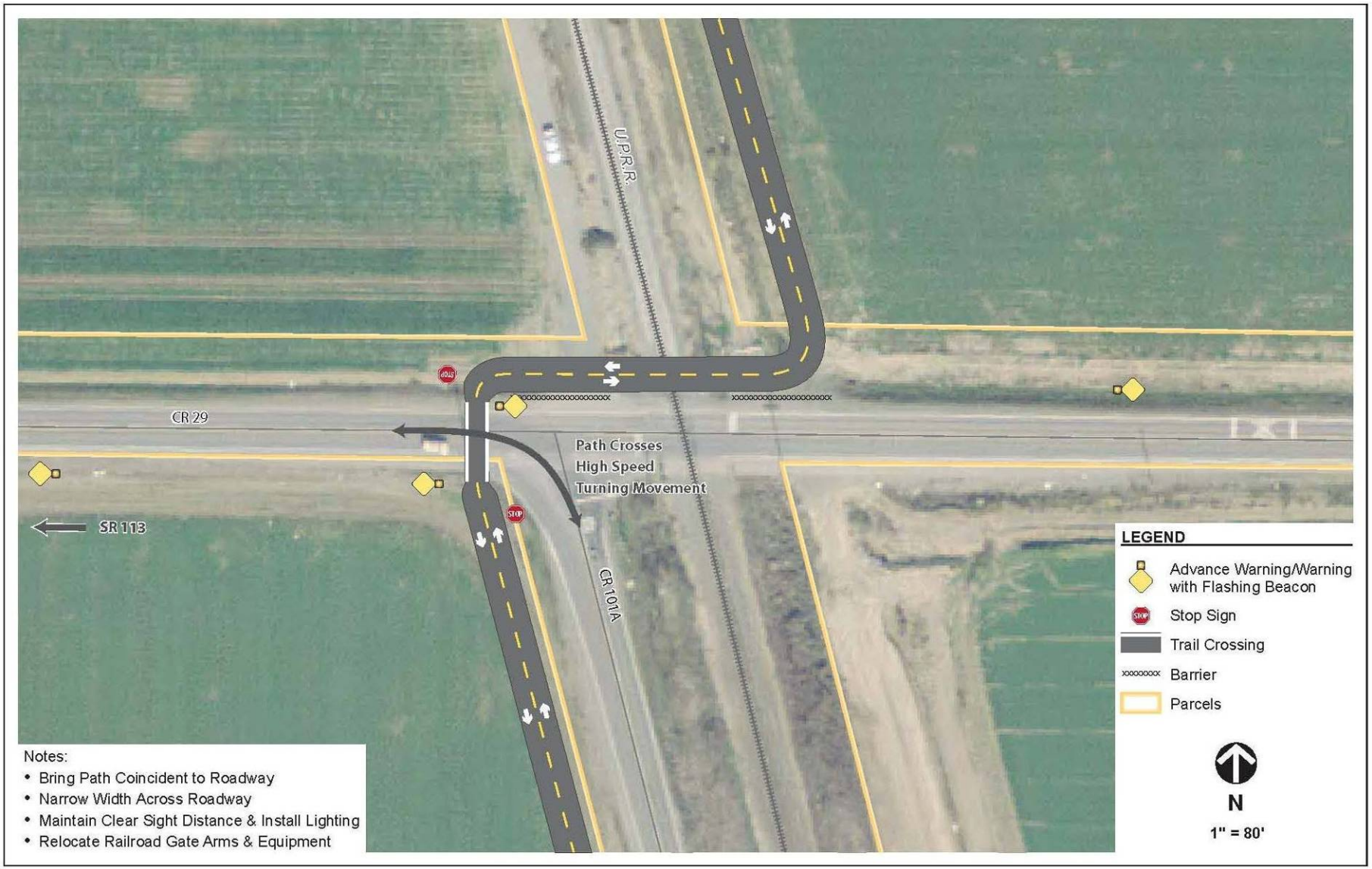


Figure 5-5: Inset C Draft ATC Crossing

Figure 5-6: Inset D Draft ATC Crossing

Figure 5-7: Inset E Draft ATC Crossing

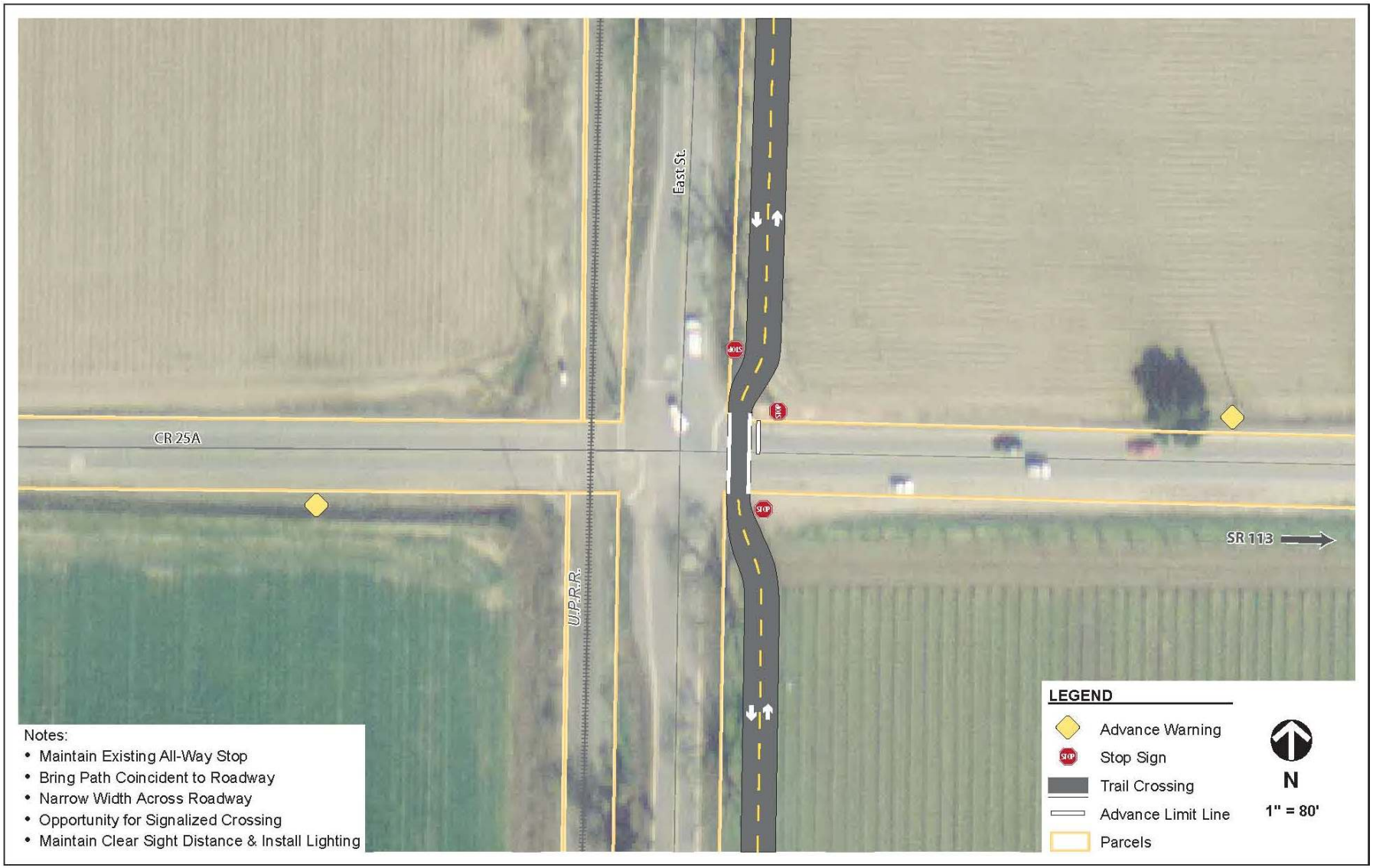


Figure 5-8: Inset F Draft ATC Crossing

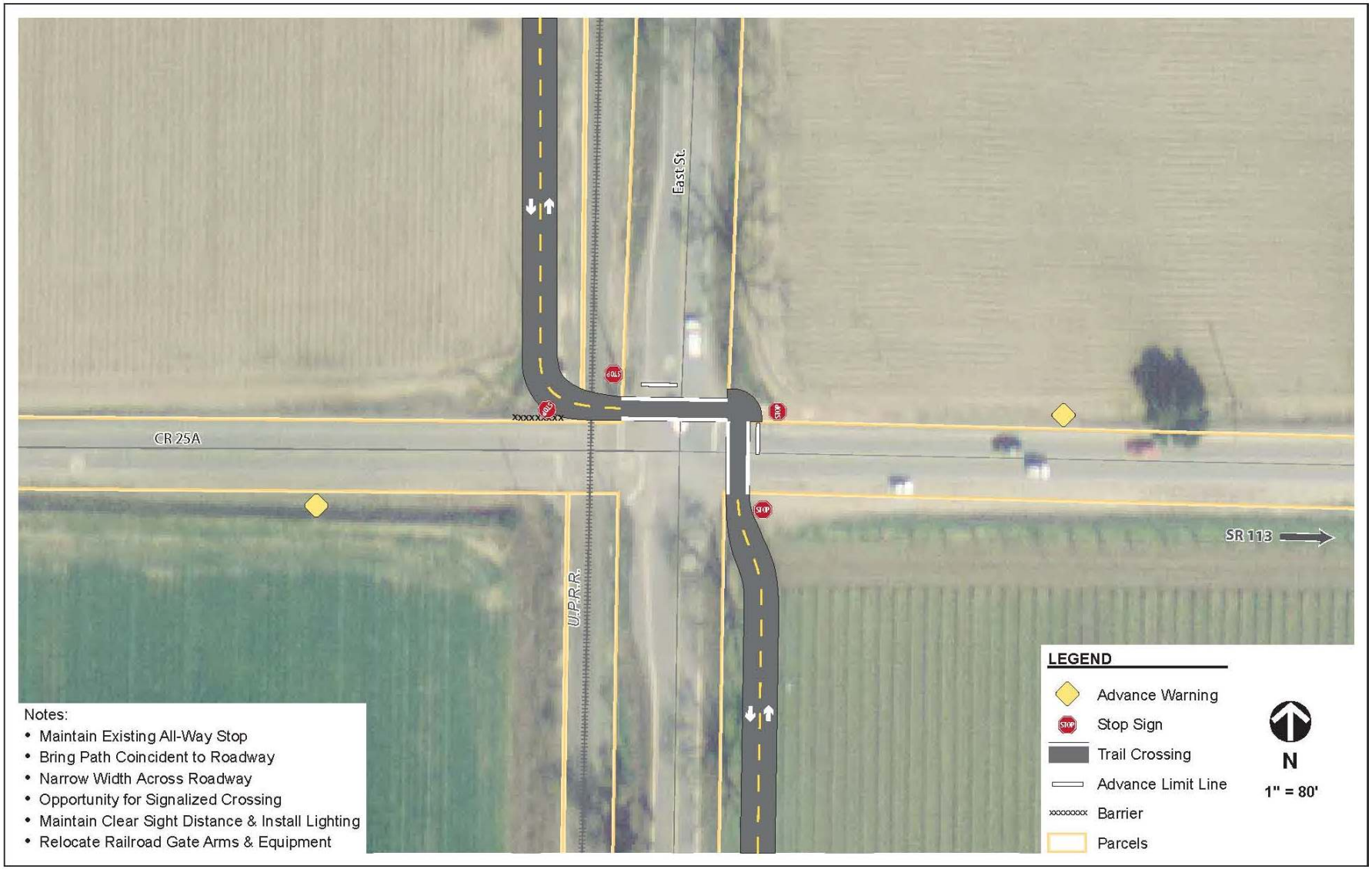


Figure 5-9: Inset G Draft ATC Crossing

Figure 5-10: Inset H Draft ATC Crossing

5.1.2 Signage and Striping

If the jurisdictions decide that the route will accommodate NEVs, portions of the alignment would be on-street, the California Traffic Control Devices Committee (CTCDC) approved experimental standards, as shown below, for the City of Lincoln and Rocklin are recommended. Approval from the CTCDC will be required to install these signs. Additional CTCDC approvals will be required to modify the MUTCD Class I bike path signs.

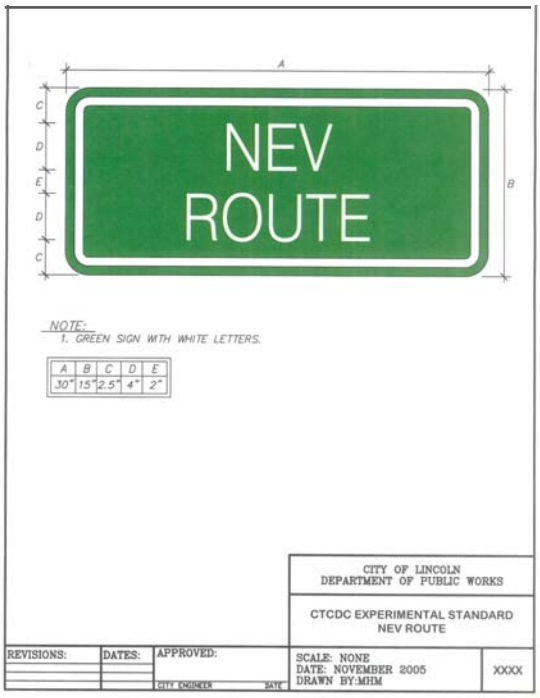


Figure 5-11: NEV Route Sign

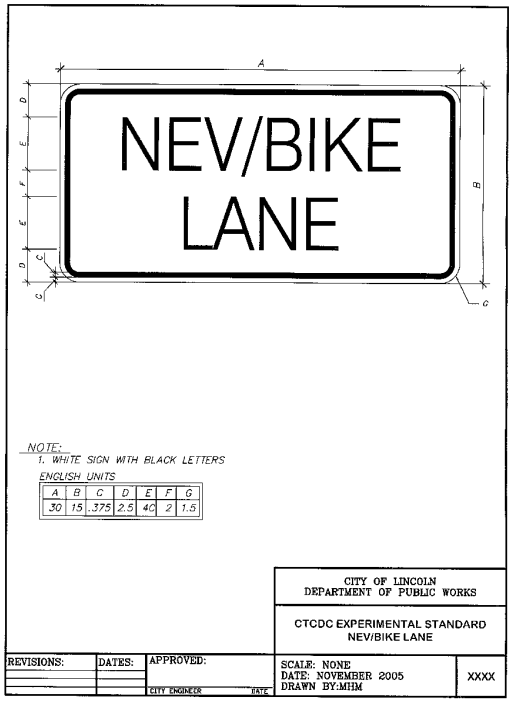


Figure 5-12: NEV/Bike Lane Sign

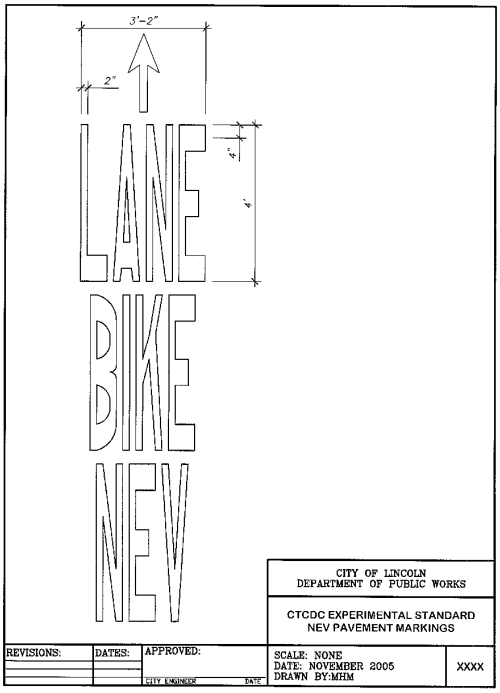


Figure 5-13: Pavement Marking Standard

Figure 5-14: Standards currently used in the City of Lincoln, CA (Class II route)

Charging Stations and Amenities

If the jurisdictions decide that the route will accommodate NEVs, charging stations would be appropriate to install at each end of the trailhead. An NEV can easily travel 20 to 30 miles on a single battery charge. However, additional charging stations could be added at various locations near intersections where lighting is proposed, and where electrical conduits are easily accessed.

One example of a charging station standard detail is included below:

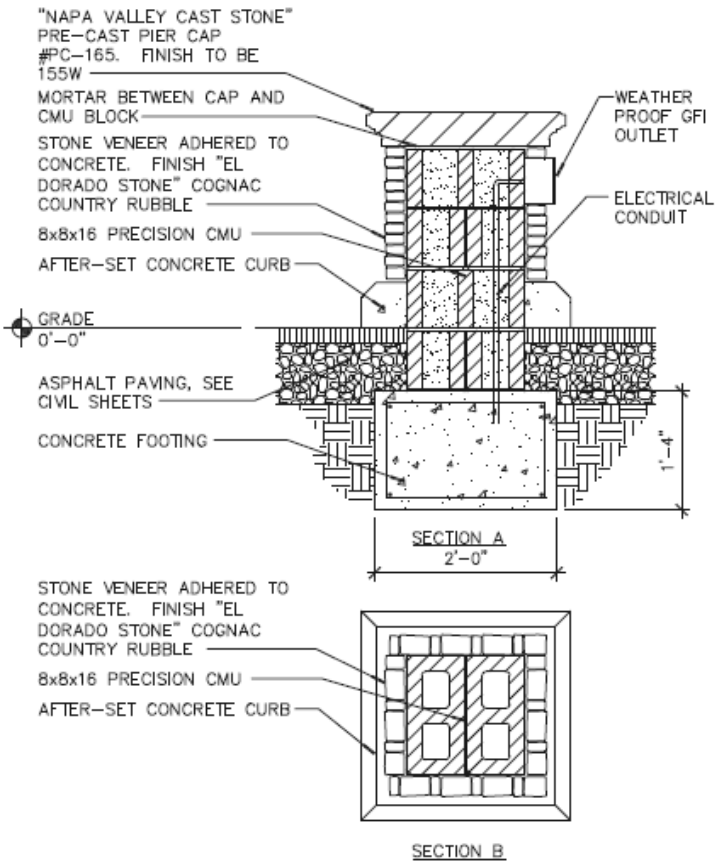


Figure 5-15: Example of a Charging Station Detail

Figure 5-16: Charging Station photo

Amenities for ATC users will be determined based on a variety of factors, including the level of usage at a particular location, funding, community support, and the amount of physical space available. Trail amenities may include benches, bike racks, information kiosks, restrooms, drinking fountains, trash receptacles.

5.2 Cross Sections

A number of different cross sections have been considered, specifically regarding the Class I off-road path options. **Figures 5-2-1** through **5-2-5** illustrate the candidate cross sections presented at Community Meeting #2. A community preference for a particular Class I cross section was mixed (refer to Chapter 2 for more information). Below is a general description of each cross section and a recommendation for further consideration:

- Figure 5-2-1: Class I – Off-road Bike Path: Traditional 10-foot wide Class I bike path with center stripe to delineation between directions.
- Figure 5-2-2: Class I – Off-road Bike/NEV Path: 16-foot wide Class I Bike/NEV path with center stripe to delineate between directions with a 4-foot pedestrian path.
- Figure 5-2-3: Class I – Off-road Bike/NEV path: 14-foot wide NEV lanes and separated 8-foot wide bike lane.
- Figure 5-2-4: Class II – On-street Bike Lane: Typical class II 4-foot bike lane.
- Figure 5-2-5: Class II – On-street Shared Bike/NEV Lane: 7-foot wide lane shared by bikes and NEVs.

The Project Team has contemplated the merits of Figures 5-2-2 and 5-2-3 in the context of a seamless alternative transportation corridor, and if the jurisdictions decide that the route will accommodate NEVs, the Project Team recommends the cross section shown in Figure 5-2-2 (or a variation of it) for the following reasons:

- A shared bike/NEV path of this design mimics a typical Class III bikeway with the benefit of the facility only being accessible to NEVs and not general vehicle traffic.
- When NEVs are not present, the shared path concept provides greater flexibility and a wider path for use by cyclists, the primary intended users of the trail.
- Figure 5-2-3 may inadvertently invite bicyclists and pedestrians to use the designated NEV space when the parallel bike path is congested.
- Delineating by direction as opposed to by mode is consistent with general rules of the road. When both NEVs and bicyclists are present traveling in the same direction, the faster conveyance (typically the NEV) would pass in the left.
- Existing shared bike/NEV facilities (such as City of Lincoln, California and Peachtree City, Georgia) have a positive safety history. The City of Lincoln Police Department has **no** reported NEV versus bike or pedestrian collisions or fatalities. The Peachtree City golf cart/NEV/bike/ped/ path network utilizes a much narrower cross section (Refer to Appendix G) – approximately 10 feet to accommodate multiple modes on a two-way path. Peachtree City has a 90-mile network of paths and a high rate of usage with an estimated 9,000 to 10,000 golf carts. Even with this level of use, only one fatality has been reported in the last six years.
- Relative to bicycle traffic, NEV use is predicted to be fairly low, at least in the short term. If NEV use accelerated to a point where modal separation is desired, the path could be modified to be consistent with Figure 5-2-3.

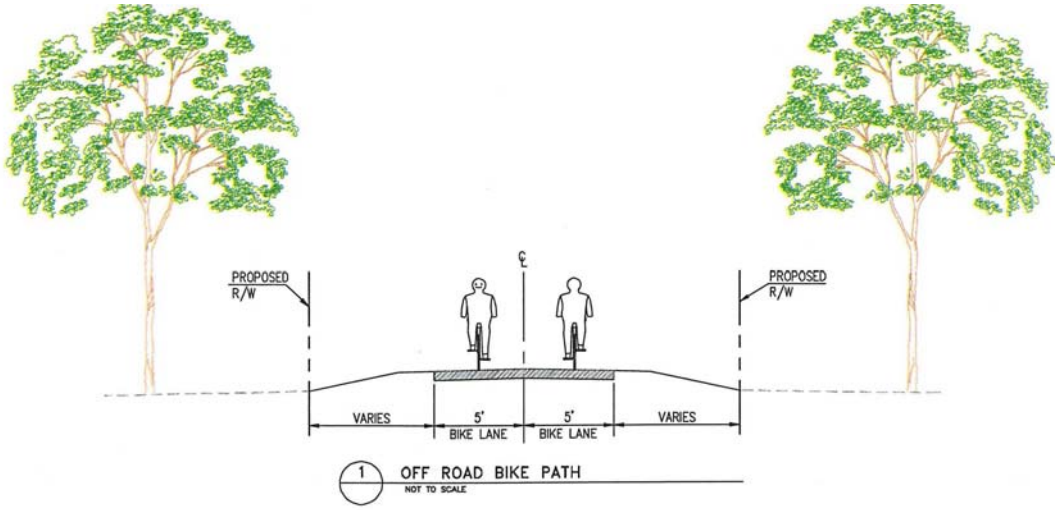


Figure 5-2-1: Class I – Off-Road Bike Path

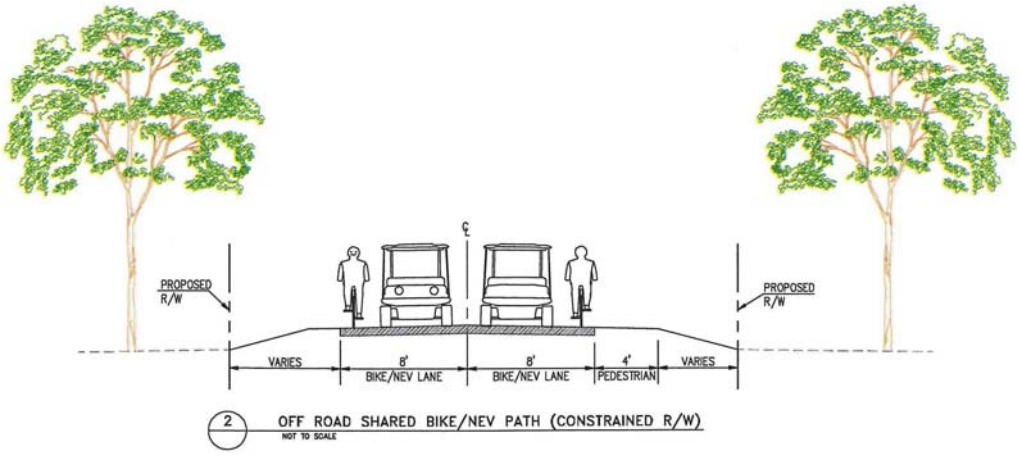


Figure 5-2-2: Class I – Off-Road Shared Bike/NEV Path (Constrained R/W)

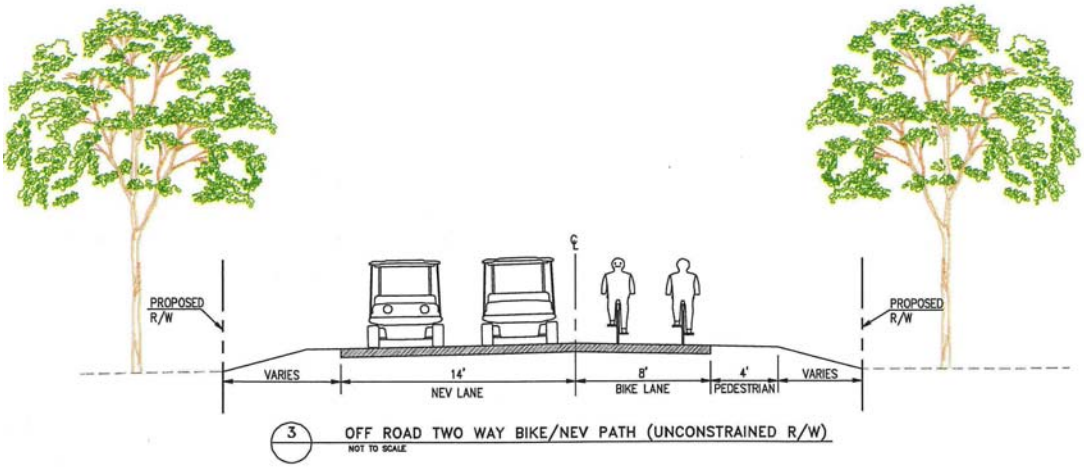


Figure 5-2-3: Class I – Off-Road Two-Way Bike/NEV Path (Unconstrained R/W)

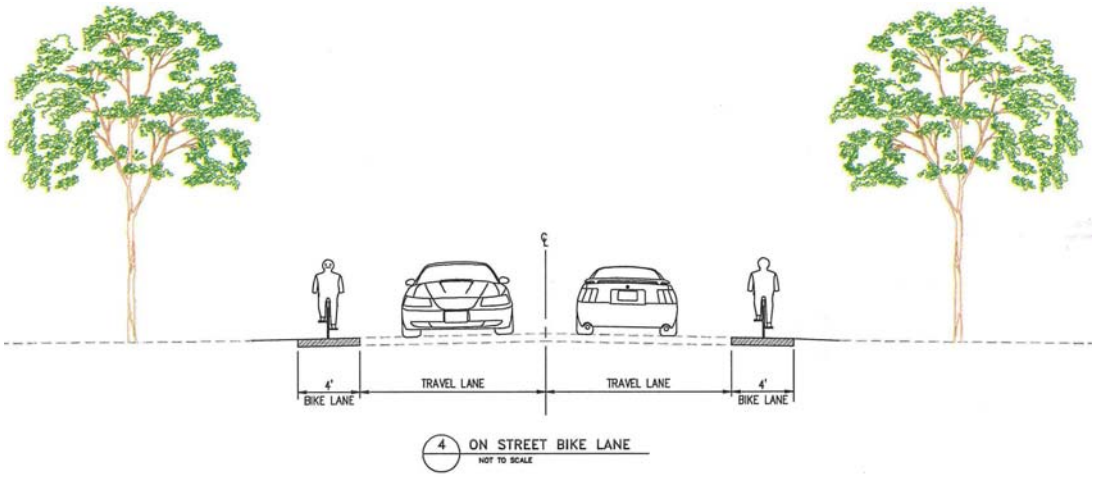


Figure 5-2-4: Class II – On-Street Bike Lane

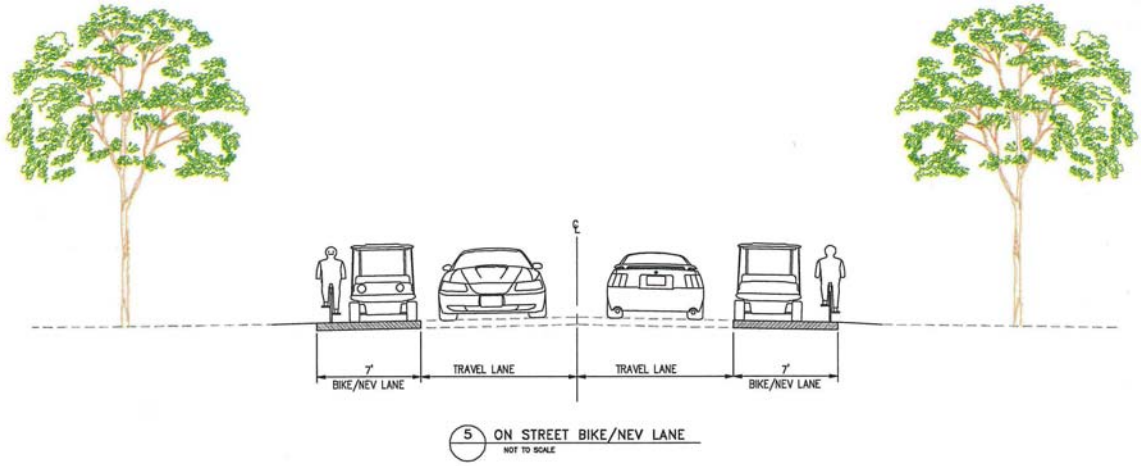


Figure 5-2-5: Class II – On -Street Bike/NEV Lane

5.3 Shared Use

5.3.1 NEVs & Bicycles

Class II Bike/NEV shared-use 7-foot lanes have been safely utilized by residents in the City of Lincoln since 2006. There have been no reported collisions between bicyclists and NEV users.

Class I (golf cart) paths in Sun City Lincoln Hills are shared by golf carts, NEVs, pedestrians and bicycles, without incident.

The speed differentials of walking (5 mph), bicycling (15 mph) and NEVs (25 mph maximum) on an off-road facility are all within a close range of speed, therefore shared path use results in minimal conflicts. More conflicts and higher safety risks are introduced when on-road Class II and Class III roadways are used to

accommodate these modes. For example, there are significant speed differentials, between automobiles (55 mph) and bikes (15 mph); and automobiles and NEVs (25 mph).

5.3.2 Rules of the Road

If the jurisdictions decide that the route will include NEVs, the following are suggested rules that may be prepared for an informational brochure, posted on websites, and posted at trailheads.

Only the following may use the alternative transportation corridor:

- Pedestrians
- Non-motorized vehicles
- Rollerskaters, rollerbladers & skateboarders (daylight only)
- Registered NEVs (An NEV is a four-wheeled electric vehicle whose top speed is between 25 mph and complies with federal motor vehicle safety standards for low-speed vehicles)
- Emergency and authorized maintenance vehicles
- Bicycles (traditional and electric)
- Wheelchairs (conventional and electric)

The following are strictly prohibited:

- Automobiles & trucks (except authorized maintenance and emergency vehicles)
- Motorcycles, motorized street/trail bikes, mini-bikes, and mopeds
- Horses
- Go-carts
- Unregistered NEVs
- Electric or gasoline powered scooters
- Motorized play vehicles (coaster, scooter, pocket bike, and any other motorized vehicle that is not an NEV, electric bicycle, or motorized wheelchair)
- Any vehicle designed to travel faster than 25 mph (except as permitted above)

5.3.3 Recommendations for Shared Use

Based on the experience of the Project Team, discussions with various transportation officials, examples of successful shared-use facilities in the City of Lincoln and elsewhere, and the researched performed on Peachtree City, Georgia's multi-use trail system (see **Appendix G**), a shared-use bike/NEV corridor designed with the above recommended design details, and appropriate signage and striping, would encourage and promote safe, low-emission/clean travel between the cities of Davis and Woodland.

5.4 Sound

Residents and stakeholders have expressed concern regarding NEVs passing bicyclists, and the fact that NEVs are silent-running; therefore bicyclists may not hear NEVs approaching from behind unless they provided an audible warning.

The Path Rules of the ATC will instruct users that an audible warning is required from operators of NEVs, bicyclists, and skaters when approaching from the rear. This is also a rule of common courtesy and the majority of users will tend to adhere to them.

5.5 Equestrian

Equestrian paths are not recommended along the corridor for the following reasons:

- Extra right-of-way required for limited demand/usage.
- Public concerns with horses reacting unfavorably to NEVs, bicycles, or pets.
- Access to trail would need to be studied and planned.

5.6 Lighting

Research was performed to examine potential lighting options that may be beneficial along portions of the corridor in remote areas. The following is a summary of information on existing design guidelines, safety lighting, regulatory signage, other trail comparisons, and modern lighting options.

5.6.1 Caltrans Design Guidelines

As referenced from the Caltrans Highway Design Manual, Chapter 1000, Topic#1003.1 paragraph #16:

"*Lighting*. Fixed-source lighting reduces conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the bicycle path direction, surface conditions, and obstacles. Lighting for bicycle paths is important and should be considered where riding at night is expected, such as bicycle paths serving college students or commuters, and at highway intersections. Lighting should also be considered through underpasses or tunnels, and when nighttime security could be a problem.

Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaires and standards should be at a scale appropriate for a pedestrian or bicycle path."

5.6.2 Safety Lighting

Lighting should be considered along remote portions of a Class I trail to enhance safety, and lighting should be provided at intersections. Should the addition of lighting prove to be cost prohibitive, regulatory/traffic control/warning signs can be posted at trailheads. Trailhead and orientation signs come in many forms depending on the setting and information needs. Trail rules signs and regulatory signs alert trail users on limitations of trail use and their responsibilities in using the trail. The type of information restricting hourly usage of the trail may be necessary to notify bike and pedestrian travelers of restrictions such as evening hours between sunset and sunrise.

Neighborhood Electric Vehicles are required by law to be equipped with headlamps, tail lights and reflectors. Even without lighting along the trail, a NEV can safely travel at night. Bicyclists riding at night are required to provide their own lighting.

5.6.3 Trail Comparison – American River Parkway

The Sacramento County bike/ped coordinator was contacted in an effort to research other local multi-use path networks, and examine design characteristics that may be useful to the development of the Woodland-Davis ATC. Sacramento County provided the following information on the American River Parkway (which extends throughout Sacramento County):

- There is no lighting on the American River Trail (except for intersections).
- The County Parks Department is responsible for and pays for maintenance of the American River Trail from the Fish Hatchery to the Sacramento River with Measure A Transportation funds. The State Parks Department is responsible for and pays for maintenance from the Hatchery to Folsom.
- There is Emergency vehicle access at several locations along the trail as well as several emergency call boxes.
- The facility is open from sunrise to sunset. There are no gates.

5.6.4 Modern Lighting Options

In a 2002 report titled *Solar Powered Lighting Systems*, prepared by SMUD's Customer Advanced Technology Program, two completed photovoltaic (PV) lighting projects were featured - the South Parking Lot at CSU Sacramento, and the Dan McAuliffe Memorial Ballpark in Sacramento. Although these systems are initially more expensive (average $5,200 per system) they provide long term benefits. These systems would be well suited in remote locations where trenching and tying into electrical power systems are challenging.

CSUS South Parking Lot

City of Dania Beach, Florida

The project photo above in the City of Dania Beach is an example of PV lighting.

LED lights

Along Gardiners Creek Trail in Australia, an innovative idea using LED lights is pictured at right. They can be travelled over without damaging the lights.

Source: http://treadly.net/2007/05/05/clear-for-take-off-on-the-gardiners-creek-trail/

6 Preliminary Cost Estimate

This section includes breakdown summary of the estimated costs to implement the alternative transportation corridor alternatives. Preliminary cost estimates include:

- Roadway construction
- Structures construction
- Right-of-Way Acquisition
- Environmental Documentation and Mitigation
- Permitting
- Preliminary Engineering/Design
- Construction Support
- Appropriate Contingencies

Each of the three alignments were analyzed using a variety of options that included: on-road and off-road; east or west of CNRR; constrained and unconstrained right-of-way. A *constrained* right-of-way refers to off-road shared Bike/NEV path (refer to Figure 5-2-2). An *unconstrained* right-of-way configuration refers to a two-way *separated* Bike and NEV path.

Included in **Appendix E** are detailed cost estimate breakdowns for an off-road facility.

Table 6-1: Preliminary Cost Estimate

CONSTRUCTION COSTS		Alt 1	
Element Description	**Bike Only**	**Bike/NEV (Constrained)**	**Bike/NEV (Unconstrained)**
Construction	$4,045,653	$5,721,608	$6,904,397
Mobilization (10%)	$404,600	$572,200	$690,500
Construction Contingency (25%)	$1,112,600	$1,573,500	$1,898,800
Environmental Mitigation/Enhancement (3%)	$133,600	$188,900	$227,900
Property/Easement Acquisition	$1,111,197	$1,438,020	$1,634,114
Subtotal	$6,807,700	$9,494,300	$11,355,800
SUPPORT COSTS			
Design and Engineering (20%)	$1,112,571	$1,573,462	$1,898,739
R/W Support (2%)	$111,257	$157,346	$189,874
Planning (5%)	$278,143	$393,365	$474,685
Environmental Documentation (3%)	$166,886	$236,019	$284,811
Construction Admin/Overhead (10%)	$556,285	$786,731	$949,370
TOTAL COST	**$9,040,000**	**$12,650,000**	**$15,160,000**
YEARLY MAINTENANCE COSTS			
Pavement	$32,032	$51,251	$70,470
Electrical	$2,520	$2,520	$2,520
Weed Control	$3,500	$3,500	$3,500
Path Closure	$20,000	$20,000	$20,000
Fencing	$5,700	$5,700	$5,700
TOTAL COST/YR	**$64,000**	**$83,000**	**$103,000**

CONSTRUCTION COSTS		Alt 2 RECOMMENDED ALT.	
Element Description	**Bike Only**	**Bike/NEV (Constrained)**	**Bike/NEV (Unconstrained)**
Construction	$4,575,000	$6,424,100	$7,759,100
Mobilization (10%)	$457,500	$642,500	$776,000
Construction Contingency (25%)	$1,258,200	$1,766,700	$2,133,800
Environmental Mitigation/Enhancement (3%)	$151,000	$212,000	$256,100
Property/Easement Acquisition	$540,800	$699,900	$795,300
Subtotal	$6,982,500	$9,745,200	$11,720,300
SUPPORT COSTS			
Design and Engineering (20%)	$1,258,140	$1,766,660	$2,133,780
R/W Support (2%)	$125,814	$176,666	$213,378
Planning (5%)	$314,535	$441,665	$533,445
Environmental Documentation (3%)	$188,721	$264,999	$320,067
Construction Admin/Overhead (10%)	$629,070	$883,330	$1,066,890
TOTAL COST	**$9,500,000**	**$13,280,000**	**$15,990,000**
YEARLY MAINTENANCE COSTS			
Pavement	$29,423	$49,884	$68,591
Electrical	$2,520	$2,520	$2,520
Weed Control	$3,500	$3,500	$3,500
Path Closure	$15,000	$15,000	$15,000
Fencing	$4,600	$4,100	$4,100
TOTAL COST/YR	**$56,000**	**$76,000**	**$94,000**

CONSTRUCTION COSTS		Alt 3	
Element Description	**Bike Only**	**Bike/NEV (Constrained)**	**Bike/NEV (Unconstrained)**
Construction	$4,929,700	$6,395,200	$7,660,900
Mobilization (10%)	$493,000	$639,600	$766,100
Construction Contingency (25%)	$1,355,700	$1,758,700	$2,106,800
Environmental Mitigation/Enhancement (3%)	$162,700	$211,100	$252,900
Property/Easement Acquisition	$549,300	$710,900	$807,800
Subtotal	$7,490,400	$9,715,500	$11,594,500
SUPPORT COSTS			
Design and Engineering (20%)	$1,355,680	$1,758,700	$2,106,760
R/W Support (2%)	$135,568	$175,870	$210,676
Planning (5%)	$338,920	$439,675	$526,690
Environmental Documentation (3%)	$203,352	$263,805	$316,014
Construction Admin/Overhead (10%)	$677,840	$879,350	$1,053,380
TOTAL COST	**$10,210,000**	**$13,240,000**	**$15,810,000**
YEARLY MAINTENANCE COSTS			
Pavement	$31,667	$50,666	$69,666
Electrical	$2,520	$2,520	$2,520
Weed Control	$3,500	$3,500	$3,500
Path Closure	$10,000	$10,000	$10,000
Fencing	$5,700	$4,800	$4,800
TOTAL COST/YR	**$44,000**	**$62,000**	**$81,000**

7 Comparative Analysis of Alternative Alignments

The Project Team has developed a matrix to list and rank certain important criteria associated with each of the corridor alignments. The matrix lists important alignment characteristics such as corridor length, roadway and railroad crossings, and other impacts. It also lists safety criteria, facility demand, engineering and feasibility and facility cost. Each of the alternative alignments are ranked using a points system representative of *high*, *moderate* or *low* impacts. The scores are weighted and tabulated.

7.1 Summary of Analysis

Criteria	Alternative 1		Alternative 2		Alternative 3	
Alignment Characteristics						
Corridor Length	6.8 miles	1	6.5 miles	3	6.7 miles	2
Roadway Crossings	6	2	5	2	6	2
Railroad Crossings	0	3	1	2	1	2
Watercourse Crossings	1	2	1	2	1	2
Number of Parcels Impacted	33	1	18	2	12	2
Subtotal Score		*9*		*11*		*10*
Safety						
Proximity to Vehicle Traffic	Adjacent to SR113; ~25,000 ADT	0	Adjacent traffic (~2,500 - 5,000 ADT)	3	Adjacent traffic (~2,500 - 5,000 ADT)	3
Potential for Vehicle Conflict	At crossings and adjacent	1	Primarily at crossings	2	Primarily at crossings	2
Remoteness	Majority of corridor visible	3	Portions of the corridor are remote	2	Large portion of corridor is remote	1
Subtotal Score		*4*		*7*		*6*
Facility Demand						
Route Connectivity to Other Existing Bikeways	4 existing connections	3	4 existing connections	3	4 existing connections	3
Route Connectivity to Future Bikeways	2 planned connections	3	2 planned connections	3	1 planned connection	2
Scenic Value	Adjacent to SR113	1	Open field viewshed	2	Open field viewshed	2
Proximity to Activity Centers and Supporting Land Use		1		3		1
Proximity to Future Activity Centers and Supporting Land Use		1		2		3
Travel Time (CBD to CBD)		1		2		1
Subtotal Score		*10*		*15*		*12*
Facility Cost						
Total Cost	9,500,000	1	13,280,000	2	15,990,000	3
Subtotal Score		*1*		*2*		*3*
Total Score		**24**	**0**	**35**	**0**	**31**

7.2 Corridor Evaluation Criteria

Alignment Characteristics

1. **Corridor Length** – The length of the entire corridor from beginning to end (terminus) in miles
   - Shortest 3 points
   - Middle 2 points
   - Longest 1 point
2. **Road Crossings** – The total number of roadway crossings. The larger the number of roadway crossings the greater the risk of vehicle conflicts.
   - <5 3 points
   - 5 – 8 2 points
   - 8-10 1 point
   - >10 0 points
3. **Railroad Crossings** – Railroad crossings can be problematic for bicycles and NEVs and require good design principles. The fewer the crossings the better.
   - 0 3 points
   - 1 2 points
   - 2 1 point
   - 3 0 points
4. **Watercourse Crossings** – Crossings of creeks, rivers, and wetlands add to environmental considerations and construction costs.
   - 0 3 points
   - 1-2 2 points
   - 3-4 1 point
   - >4 0 points
5. **Number of Parcels Impacted** – The number of private land parcels that need to be crossed add to negotiation time and cost and coordination efforts. The perception of safety and enforcement issues tend to be higher. The availability of public right-of-way can reduce the overall implementation costs.
   - 0-15 3 points
   - 16-30 2 points
   - 31-45 1 point

Safety Considerations

1. **Proximity to Vehicle Traffic** – A good number of surveys show that bicyclists and NEV users prefer to travel in their own space separated from adjacent traffic. In addition, roadways with lower traffic volumes are usually preferred. This criteria assumes that the proposed facility will not share the road with vehicle traffic, but still may traverse near it.
   - ADT < 5,000 3 points
   - ADT 5,000 -10,999 2 points
   - ADT 11,000-15,000 1 point
   - ADT >15000 0 points
2. **Potential for Vehicle Conflicts** – This safety measure would consider the volume and speed of vehicles on the same or adjacent roadways. This criteria assumes that the proposed facility will not share the road with vehicle traffic, but still may traverse near it.
   - Low 3 points
   - Moderate 2 points
   - High 1 point
3. **Remoteness** – This measure considers the average distance in miles to the nearest activity center, commercial center, or residential area. In general, perceived level of safety tends to decrease as remoteness increases.
   - Low 3 points
   - Moderate 2 points
   - High 1 point

Facility Demand

1. **Route Connectivity to Other Bikeways** – Does the route connect to one or more existing bikeways?
   - Yes (2 or more) 3 points
   - Yes (1) 2 point
   - No 1 point
2. **Route connectivity to Future Bikeways** – Will the route connect to future or planned bikeways?
   - Yes 3 points
   - Potentially 2 points
   - No 1 point
3. **Scenic Value** – Does the route offer scenic viewsheds?
   - Low 1 point
   - Moderate 2 points
   - High 3 points
4. **Proximity to Existing Activity Centers and Supporting Land Use** – Distance in miles to nearest activity center, commercial center, or recreation area. Primarily based on Connections and Bicycle Coverage By Travel Time graphic.
   - Low 1 point
   - Moderate 2 points

- High 3 points

5. **Proximity to Future or Planned Activity Centers and Supporting Land Use**
   - Low 1 point
   - Moderate 2 points
   - High 3 points
6. **Travel Time from CBD to CBD** – Travel time in minutes from Davis CBD to Woodland CBD assuming 12 mph average travel speed.
   - < 30 minutes 3 points
   - 31 – 60 minutes 2 points
   - > 60 minutes 1 point

Construction and Support Costs

1. **Total Costs** – The total construction and support costs for each alignment
   - Lowest cost 3 points
   - Middle cost 2 points
   - Highest cost 1 point

Estimates included, but are not limited to, the following cost breakdowns:

- CONSTRUCTION (may include the following: Clearing and Grubbing, Grading and Drainage, Ditch Excavation, Embankment, Asphalt Concrete Type A, Aggregate Base Class 2, Fence/Barrier, Striping, Lighting, Retaining wall, Bridge)
  - Mobilization (10%)
  - Construction Contingency (25%)
  - Environmental Mitigation/Enhancement (3%)
  - Property/Easement Acquisition

- SUPPORT COSTS
  - Design and Engineering (20%)
  - R/W Support (2%)
  - Planning (5%)
  - Environmental Documentation (3%)
  - Construction Admin/Overhead (10%)

7.3 Environmental Impacts

Environmental Science Associates (ESA) prepared a memorandum (included as **Appendix F**) to identify the biological resources that exist in the project area and discuss how related constraints may affect project planning associated with the proposed ATC Project. The memo is not intended for purposes of fulfilling California Environmental Quality Act (CEQA) requirements or use in the application for project permits, but as a tool for use during initial project planning. Implementation of the proposed project will require additional focused biological surveys of which the results can be used for the preparation of a CEQA document, permit applications, and agency consultation.

7.3.1 Summary of Sensitive Biological Resources from the Baseline Memo

Sensitive resources and special-status species observed in the project area listed in the June 9, 2009 memorandum, and further described in the **Existing Conditions Memorandum** Figure 7-3.

- Riverine habitat (Dry and Willow Slough and various road-side ditches) exists within all three project options.
- Agricultural ditches that may provide suitable habitat for giant garter snake exist within all three project options.
- Valley foothill riparian habitat exists along Dry and Willow Slough within all three project alternatives.
- Blue elderberry shrubs are present within and/or adjacent to (within 100 feet) all three project options and if stems are greater than 1" diameter at ground level may provide suitable breeding habitat for the valley elderberry longhorn beetle.
- A pair of Swainson's hawks exhibiting nesting behavior were observed perched next to a nest in a small tree just south of the intersection of options 1 and 2.
- White-tailed kite was observed within option 1 and a northern harrier was observed within both options 1 and 2 project areas.

No other sensitive species or natural communities identified above would be expected to be encountered within the study area. Focused wildlife, plant and habitat surveys must be conducted within and adjacent to the project area prior to construction to determine existence of special-status species and natural communities that may occur within the study area.

7.3.2 Additional Environmental Surveys that may be required include:

- nesting raptor and songbird
- giant garter snake
- valley elderberry longhorn beetle/elderberry shrub
- California tiger salamander
- California red-legged frog
- bat
- rare plant

- wetland delineation
- habitat/sensitive natural community mapping

7.3.3 Regulatory and Permitting Constraints

Potential and required permitting to implement the project are influenced by impacts to natural resources, including sensitive natural plant communities, special-status plant and wildlife species, wetlands and other waters of the U.S. Permit requirements will include mitigation in the form of on-site restoration where feasible or offsite mitigation. Off-site mitigation can take the form of purchasing mitigation bank credits, in-lieu fees or long-term mitigation and monitoring. All of these mitigation types will require financial expenditures based upon the level of permanent and temporary impacts.

The following is a summary of the expected and potential permitting required for the three alternative alignments.

Permitting Requirements:

- Obtain Section 404 (Clean Water Act) permit from U.S. Army Corps of Engineers (Corps)
- Obtain Streambed Alteration Agreement from CDFG under Sections 1601-1616 of the CA Department of Fish and Game Code
- Obtain Section 401 CWA permit from the Regional Water Quality Control Board.

Potential Permitting Requirements:

- Consultation with USFWS under Section 7 of the Federal Endangered Species Act (FESA)
- Management agreement with CDFG under the California Endangered Species Act (CESA)

7.3.4 Conclusion

If implemented, each of the three proposed alternative alignments could result in direct impacts (high constraint) to sensitive species or habitats.

Appendices

BEN|EN
TRUSTED ENGINEERING ADVISORS

Alternative Transportation Corridor Feasibility Study

EXISTING CONDITIONS MEMORANDUM

May 2009

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City of Woodland
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Neighborhood Electric Vehicles (NEVs)

NEVs are small, electric-powered personal vehicles, and are suitable vehicles for short local trips. While they may look like a golf cart to the casual observer, NEVs are actually motor vehicles that can be driven on public streets with certain restrictions which include: a driver's license, Vehicle Identification Number (VIN), registration, insurance, and adherence to vehicle safety standards. In 1994, the Federal Department of Transportation defined the street-legal Low Speed Vehicle (LSV) in the Code of Federal Regulations. NEVs are a federally-recognized sub-class of LSV. NEVs are limited to 25 miles per hour (mph) by federal requirements, and may be driven on streets with speed zones of 35 mph or less.

NEVs are 100% battery-electric powered vehicles. Many factors can affect the driving range of a NEV, including ambient temperature, terrain, driving conditions, payload, driving habits, battery age, and tire pressure. It is difficult to estimate an exact driving range distance, but a typical GEM© (Global Electric Motorcars, a DaimlerChrysler Company) brand vehicle as *pictured right*, used under proper conditions with fully charged batteries, can get up to 30 miles on a charge. To put this in perspective, a NEV can easily travel roundtrip from downtown Woodland to Downtown Davis (approx 20 miles) without needing a charge.

GEM 4-passenger vehicle

Kurrent - American Electric Vehicle Company

The benefits from expanding NEV use include, but are not limited to: energy savings (reduced gasoline consumption), improved air quality, cost savings, greater mobility for impaired drivers, reduced congestion on freeways, community cohesion, and support of local businesses.

NEVs produce no tailpipe or evaporative emissions that contribute to air pollution and global warming. The energy required to operate an NEV is less than one-fifth when compared to a conventional automobile.

NEVs do not contribute to the pollution caused by cold-starts. The facts listed below were collected from a survey conducted by Global Electric Motorcars (2005):

- For NEV owners who also drive conventional motor vehicles, NEVs replace the use of cars and light trucks approximately two-thirds of the time.
- NEV owners use their NEVs every day.
- NEV owners make short trips. More than 75% of trips are three miles or less.
- On the average, two cold-starts per day are eliminated. 516 grams of (NMOG and NOx) pollution are eliminated each year just from the cold-starts of one vehicle.

Woodland-Davis Alternative Transportation Corridor Study

1. Where do you live?

Answer Options	Response Frequency	Response Count
Davis	66.5%	189
Woodland	29.6%	84
Unincorporated Yolo County	3.9%	11
Other (please specify)		11
answered question		284
skipped question		9

Nearly 300 participants in the survey. The majority live in Davis.

2. Where do you work?

Answer Options	Response Frequency	Response Count
Davis	75.1%	184
Woodland	12.2%	30
Unincorporated Yolo County	2.9%	7
NA	9.8%	24
Other (please specify)		56
answered question		245
skipped question		48

The majority of respondents work in Davis. The most common "Other" location cited is Sacramento.

3. If you are a student, where is your school located?

Answer Options	Response Frequency	Response Count
Davis	16.9%	36
Woodland	0.0%	0
Unincorporated Yolo County	0.0%	0
NA	83.1%	177
Other (please specify)		0
answered question		213
skipped question		80

Fairly low student response, which indicates UC Davis students are not a large percentage of respondents.

4. How often do you travel between Woodland and Davis?

Answer Options	Response Frequency	Response Count
Once a Month	13.3%	39
Twice a Month	22.2%	65
Once a Week	20.1%	59
Several Times a Week	15.4%	45
Daily	22.5%	66
Rarely or Never	6.5%	19
answered question		293
skipped question		0

Nearly 60% travel between the two jurisdictions at least once a week. 23% travel between the two daily.

5. What is the primary purpose of your trips between Davis and Woodland? Check all that apply.

Answer Options	Response Frequency	Response Count
For recreation/leisure	41.8%	119
For shopping/errands	70.5%	201
To get to work	30.2%	86
To get to school	1.8%	5
I don't travel between Woodland and Davis	2.5%	7
Other (please specify)		25
answered question		285
skipped question		8

Interesting that the most commonly cited reason to travel from one jurisdiction to the other was for shopping, followed by recreation, then work. Multiple answers were permitted.

6. Do you currently ride a bicycle?

Answer Options	Response Frequency	Response Count
Yes	86.7%	254
No (if you select no, you will automatically be redirected to question #11)	13.3%	39
answered question		293
skipped question		0

High percentage of existing cyclists responding to the survey.

7. How often do you ride a bicycle?

Answer Options	Response Frequency	Response Count
Once a Month	4.8%	12
Twice a Month	4.8%	12
Once a Week	6.0%	15
Several Times a Week	34.8%	87
Daily	47.6%	119
Rarely or Never	2.0%	5
answered question		250
skipped question		43

Majority (nearly 90%) of cyclists ride at least once a week.

8. What do you use a bicycle for? Check all that apply.

Answer Options	Response Frequency	Response Count
For recreation/leisure	93.9%	231
For shopping/errands	69.1%	170
To get to work	62.2%	153
To get to school	14.6%	36
Other (please specify)		12
answered question		246
skipped question		47

Most commonly cited reason for bicycle use is recreation. Multiple answers were permitted.

9. How far, one way, do you usually ride a bicycle?

Answer Options	Response Frequency	Response Count
Less than 1 mile	4.0%	10
Between 1 and 5 miles	50.8%	127
Between 5 and 10 miles	15.6%	39
Between 10 and 20 miles	18.4%	46

Over 20 miles	11.2%	28
	answered question	250
	skipped question	43

70% of bike trips made are 10 miles or less.

10. As a cyclist, how comfortable do you feel sharing the road with low speed electric vehicles (LSVs)? LSVs are registered motor vehicles designed to meet federal safety standards and travel up to speeds of 25 miles per hour.

Answer Options	Response Frequency	Response Count
Very Comfortable	43.4%	109
Somewhat Comfortable	38.2%	96
Somewhat Uncomfortable	11.6%	29
Very Uncomfortable	5.6%	14
Not Applicable	1.2%	3
answered question		251
skipped question		42

Over 80% of cyclists feel somewhat or very comfortable sharing the road with LSVs.

11. If a bicycle path were constructed connecting Woodland and Davis, how often would you use it? *(Start of questions open to all.)*

Answer Options	Response Frequency	Response Count
Once a Month	22.1%	62
Twice a Month	16.0%	45
Once a Week	22.1%	62
Several Times a Week	17.1%	48
Daily	7.8%	22
Rarely or Never	14.9%	42
answered question		281
skipped question		12

If a path were constructed, 47% of respondents state they would use it at least once a week. This question was open to all to answer and may include individuals who currently do not ride but would consider doing so if the facility was in place.

12. What activities would you use it for? Check all that apply.

Answer Options	Response Frequency	Response Count
For recreation/leisure	82.1%	230
For shopping/errands	54.3%	152
To get to work	23.9%	67
To get to school	1.8%	5
I would not use it	6.8%	19
Other	3.2%	9
If other, please specify		14
answered question		280
skipped question		13

Most commonly cited reason is for recreation/leisure, followed by shopping, then work. Multiple answers were permitted.

13. Would you prefer an on-street bike lane over a dedicated path separated from vehicle traffic?

Answer Options	Response Frequency	Response Count
Yes	16.7%	46
No	69.2%	191
Not Applicable / No Preference	14.1%	39
answered question		276
skipped question		17

17% of respondents prefer an on-street bike lane. The majority prefer a dedicated path.

14. If a dedicated bicycle path separated from traditional vehicle traffic was constructed, which of the following would you be comfortable sharing the facility with? Check all that apply.

Answer Options	Response Frequency	Response Count
Pedestrians / Joggers	90.3%	252
Low speed vehicles (LSV) driving 25 miles per hour or less	67.7%	189
Other motorized devices such as mopeds, scooters and bikes driving 25 miles per hour or less	62.0%	173
Equestrians	40.1%	112
None of the Above	2.5%	7
Not Applicable	1.1%	3
answered question		279
skipped question		14

The comfort level of sharing the facility with other modes varies from 90% comfortable sharing with pedestrians and joggers to only 40% comfortable sharing with equestrians. Approximately 65% were comfortable sharing the facility with LSVs or other motorized low speed devices. Multiple answers were permitted.

15. If a bicycle path were constructed connecting Woodland and Davis, would it encourage you to use a bicycle more?

Answer Options	Response Frequency	Response Count
Very Likely	62.6%	174
Somewhat Likely	24.8%	69
Not Likely	12.6%	35
answered question		278
skipped question		15

Nearly 90% of respondents would be at least somewhat encouraged to ride a bicycle more if the facility was constructed. 63% would be very likely to ride more.

16. If you are interested in using the path for cycling, please indicate the importance of the following design features. (Please place a check in the appropriate selections below).
Green = most important (combined very and somewhat); Orange = least important
See additional sheet for "Other" answers.

Answer Options	Very Important	Somewhat Important	Not Important	Response Count
Path width	194	69	5	268
Path riding surface (e.g., pavement condition and texture)	229	39	2	270
Path lighting	78	124	64	266
Separation from general vehicle traffic	171	75	21	267
Separation between modes on the path	69	134	64	267
Signalized or grade-separated roadway crossings	86	120	56	262
Speed of adjacent or conflicting vehicle traffic	119	116	28	263
Information on routes and paths (e.g., maps)	66	109	90	265
Directional signage along path	64	131	70	265
Uninterrupted length (e.g., distance between driveways and intersections)	107	117	40	264
Quality of scenery	51	145	69	265
Other	27	3	14	44
If other, please specify				36
answered question				270
skipped question				23

17. Do you currently use a Low Speed Electric Vehicle (LSV)? LSVs are registered motor vehicles designed to meet federal safety standards and travel up to speeds of 25 miles per hour.		
Answer Options	**Response Frequency**	**Response Count**
Yes	4.3%	12
No (if you select no, you will automatically be redirected to question #24)	95.7%	265
answered question		**277**
skipped question		**16**

Only 12 LSV users took the survey. Small sample size limits significance of survey results.

18. How often do you drive a LSV?		
Answer Options	**Response Frequency**	**Response Count**
Once a Month	8.3%	1
Twice a Month	25.0%	3
Once a Week	8.3%	1
Several Times a Week	8.3%	1
Daily	16.7%	2
Rarely or Never	33.3%	4
answered question		**12**
skipped question		**281**

Of the 12 respondents, 33% use an LSV at least once a week and 33% rarely or never use it.

19. What do you use a LSV for? Check all that apply.		
Answer Options	**Response Frequency**	**Response Count**
For recreation/leisure	62.5%	5
For shopping/errands	87.5%	7
To get to work	37.5%	3
To get to school	0.0%	0
Other	0.0%	0
If other, please specify		1
answered question		**8**
skipped question		**285**

The most common reason cited for LSV use is for shopping/errands. Multiple answers were permitted.

20. How far, one way, do you usually drive a LSV?		
Answer Options	**Response Frequency**	**Response Count**
Less than 1 mile	0.0%	0
Between 1 and 5 miles	77.8%	7
Between 5 and 10 miles	11.1%	1
Between 10 and 20 miles	11.1%	1
Over 20 miles	0.0%	0
answered question		**9**
skipped question		**284**

The majority of LSV trips taken are less than 5 miles.

21. How comfortable do you feel driving your LSV on streets with a posted speed of 35 mph and under?

Answer Options	Response Frequency	Response Count
Very Comfortable	40.0%	4
Somewhat Comfortable	20.0%	2
Somewhat Uncomfortable	20.0%	2
Very Uncomfortable	10.0%	1
Not Applicable	10.0%	1
answered question		10
skipped question		283

60% feel comfortable or somewhat comfortable driving on roads with posted speed limits of 35mph or less.

22. If you answered "Somewhat Uncomfortable" or "Very Uncomfortable", which streets are you referring to?

Answer Options	Response Count
	3
answered question	3
skipped question	290

23.

Number	Response Date	Response Text
1	03/24/2009 09:39:00	West St
2	03/25/2009 17:21:00	Covell, Russell, Arlington
3	04/03/2009 20:10:00	Anderson and Covell

24. If a LSV path were constructed connecting Woodland and Davis, how often would you use it? *(Start of questions open to all.)*

Answer Options	Response Frequency	Response Count
Once a Month	8.9%	21
Twice a Month	7.2%	17
Once a Week	8.0%	19
Several Times a Week	6.3%	15
Daily	3.4%	8
Rarely or Never	66.2%	157
answered question		237
skipped question		56

The remaining LSV questions are challenging to interpret. We asked survey participants to speculate on using something (i.e., LSV) that they don't currently own or likely have access to now. 66% of respondents stated that they would rarely or never use an LSV path; whereas, 17% (42) stated that would use it at least once a week.

25. What activities would you use it for? Check all that apply.

Answer Options	Response Frequency	Response Count
For recreation/leisure	35.1%	72
For shopping/errands	32.7%	67
To get to work	15.1%	31
To get to school	0.5%	1
I would not use it	54.1%	111
Other	3.4%	7
If other, please specify		9
answered question		205
skipped question		88

Other than "would not use it, the most common uses are similar to biking - for recreation and shopping.

26. Would you prefer an on-street LSV lane over a dedicated path separated from other vehicle traffic?

Answer Options	Response Frequency	Response Count
Yes	18.4%	43
No	26.5%	62
Not Applicable / No Preference	55.1%	129
answered question		234
skipped question		59

Inconclusive results with preference towards dedicated path of those that responded yes or no.

27. If a dedicated LSV path separated from vehicle traffic was constructed, which of the following would you be comfortable sharing the facility with? Check all that apply.

Answer Options	Response Frequency	Response Count
Pedestrians / Joggers	32.6%	75
Bicyclists	40.4%	93
Other motorized devices such as mopeds, scooters and bikes driving 25 miles per hour or less	37.8%	87
Equestrians	14.3%	33
None of the Above	4.8%	11
Not Applicable	47.8%	110
answered question		230
skipped question		63

Fairly unbiased between peds, bikes and other motorized modes. Multiple answers were permitted.

28. If a LSV path were constructed connecting Woodland and Davis, would it encourage you to use your LSV more?

Answer Options	Response Frequency	Response Count
Very Likely	23.2%	45
Somewhat Likely	17.5%	34
Not Likely	59.3%	115
answered question		194
skipped question		99

The use of term "your" may have swayed selections here. However, fundamentally if it was built, 79 respondents indicate at least somewhat likely to use an LSV, which is 67 more than actually own an LSV now.

29. If you are interested in using the path for LSV travel, please indicate the importance of the following design features. Please place a check in the appropriate selections below.
Green = most important (combined very and somewhat); Orange = least important
See additional sheet for "Other" answers.

Answer Options	Very Important	Somewhat Important	Not Important	Response Count
Path width	70	16	14	100
Path riding surface (e.g., pavement condition and texture)	70	16	14	100
Path lighting	35	32	32	99
Separation from general vehicle traffic	56	26	16	98
Separation between modes on the path	29	43	26	98
Signalized or grade-separated roadway crossings	36	36	26	98
Speed of adjacent or conflicting vehicle traffic	49	29	20	98
Information on routes and paths (e.g., maps)	30	34	33	97
Directional signage along path	32	40	26	98
Uninterrupted length (e.g., distance between driveways and intersections)	34	39	27	100
Quality of scenery	21	36	41	98
Other	7	3	13	23
If other, please specify				11
			answered question	103
			skipped question	190

30. Please use the space below (or a separate sheet) to provide any additional comments pertaining to this study.

Number	Response Text
1	I lived in Davis until 2003 and rode my bike daily to commute to work. I am frustrated that there is no safe biking route between Woodland and Davis--the fatality of a Woodland-Davis commuter on his way home from work biking on Rd. 99 proves that that route is not safe for commuting. If there was a safe biking route between the cities, I would bicycle commute the majority of the time.
2	The current cycling routes between Davis and Woodland are extremely dangerous.
3	During the spring and Summer I prefer to bike to work (Woodland to Davis). The bike path on rd 102 is very narrow in spaces making it a little dangerous. It a new bike path was put in or the bike lane expanded that would be great.
4	If you just dropped the speed limit on Road 99 you would have a Bike/ NEV route.
5	I might buy a NEV if this path were created so I could use it to shop in Woodland.
6	Please carefully consider what modes of transportation you allow on a proposed bike path...LSV can go 25 mph, which could injure a biker. Similarly, the thought of sharing a path with a horse is not only unsanitary (horse manure), but kind of scary.
7	From my experience, there are two different type of pace on bicycle. There is a leisurely pace (less than 15mph) and there is a exercise/workout pace (over than 15mph). There is a need to create different type of solution for both cyclist segments. If you look the bike path and the bike lane in Covell Blvd between Frontage Rd and F St in Davis, that is a good example. The bike path (shared w/ pedestrian) can be use for bicyclist with leisurely pace (less than 15mph), while the bike lane (shared with other conventionals, LSV, scooter, etc) can be use with bicyclist with exercise/workout pace. Mixing both leisurely and exercise oriented bike traffic is "dicey". From my observation as an exercise oriented cyclist there is no problem in sharing the road with other conventionals and LSV that are capable of reaching 25+mph. Most conventionals usually stay away from the bike lane. In county road where there is no bike lane most conventionals usually pass around us. I feel more comfortable sharing the road with conventionals and LSV than leisurely oriented cyclist.
8	This survery says if I say I don't use an LSV I will be directed to question 24 which is for people who have LSV?? Anyway, I would love to be able to hop on my bike and go to Woodland just to ride or do a couple of errands and save my car for things further away.
9	I live in Davis and sometimes commute by bicycle to work in Woodland. Road 99 has a bike lane for much of its length, but the cars go very fast. I am fine with sharing the road with cars, but it is quite dangerous on these county roads with high speeds. I think a separate path between the cities makes a lot of sense.
10	Please look into the legality of putting a LSV on a bike path. See CVC 23127

11	I am now retired. When I worked I commuted by bicycle between Davis and Woodland. I bicycled beginning in 1985 until 2007 to work. I now bicycle daily for recreation and errands. I use my bicycle and trailer to shop in Woodland now. I can't say that I always feel safe now nor did I in the past, but I commuted by bike anyway. I have long advocated for a designated, separate bike way between the two cities. During my years of cycle commuting, I tried to interest others in doing so. The main reason that others did not commute was that they did not feel safe on the roads between the two cities. I am certain that with a designated path, many of those who wanted to but felt unsafe would reconsider their decision.
12	What is an LSV?
13	Safe and easy connectors are the most important thing if doing a separate bike path. Also the ability to trigger lights, etc. Do not want pedestrians blocking vehicles
14	Rd 99 is fine until south of Rd 29. Either widen rd99 to Covell or widen rd 29 to the frontage road of 113.
15	there are 3 bike routes Davis/woodland. CR 102, CR 99, and East St walk across the RR tracks, then onto frontage rd/CR 27 to Hwy 113 to CR 29. this is the most central route !!! please look into improving this route, thanx
16	Built it. Pretty please.
17	This needs to be about bikes.
18	I had heard that one proposal or idea for a new bikeway/path to Woodland from Davis would be to use the current train line that travels north from D to W. I think converting this to a bike/lsv lane as per "Rails to Trails" would be a great idea.
19	A path between Davis & Woodland would allow connections to other bicycling areas, not just a commuting opportunity.
20	I think we should try to encourage non-motorized vehicles (bikes and pedestrian) more than LSV
21	don't use my tax $ for it
22	Thank you for conducting this study. Safety first, expanding bicycle widths on county roadways does not make it safe for a ten year old, off-road does. Driving an NEV to the County Fair Mall and work in downtown Woodland would keep my gas car parked, which I would love.
23	I think this study is a waste of money. There are many more important projects that pertain to a greater population than this project which merely wants to a small population. How much is this going to cost the people who will never, ever use it!!??? How is it fair to put time and money into something that the majority of the population will not benefit from? Just a couple thoughts.
24	too expensive of a project at this time.
25	Survey seems faulty. A no answer to Q#17 jumps one to Q24 which still talks about LSV usage. I didn't respond to many Q's from #24 on because it was about using LSV's, which I don't.
26	Thank you for asking! Would be _wonderful_ to have safer bike riding conditions betw Woodland and Davis!
27	As someone who believes that climate change needs to be addressed aggressively, one of the arguments for a bike/pedestrian path is to encourage people to use their bikes or walk to do errands, go to work, etc (a no carbon alternative). For this, one needs a path that is safe - both as relates to other types of vehicles and to personal safety (lighting). I very much want to see this path happen. I do not think it should be shared with horses. And probably also not LSV
28	I dont have a LSV, but I was directed to this page when I answered #17, not sure why.
29	I think it should be considered that additional bike paths should be considered only after money is spent bringing our current bike path system into good repair. There are miles of very poorly maintained bike paths in Davis.
30	I am a cyclist and would rather not share a path with LSVs. However, I believe that technology is changing so rapidly that the LSV is soon to be extinct. So if we can get funding to create a bike path because of the LSVs, there's no real downside.
31	Your survey has problems. It forces into the LSV questions (i.e., #24 +) whether applicable or not, which is going to misrepresent the interest in LSV.
32	#17 is bad wording. It says "clicking no will take you to #24" - and yet #24-#29 is all about LSVs, even though I just said I don't have an LSV in question #17. Odd. I would guess your data for #17 and on is not going to be accurate.
33	The question of an "alternative vehicles path" between Davis and Woodland is an important one as more people are commuting between the two places and it is very bike-able as it is flat and there is lots of open space between the two cities. It seems as though a path on one of the roadways would work, but if the demand is high enough, an off-road facility would also work. An off-road facility would help to promote the multi-modal use for equestrians, LSVs, joggers with strollers, etc. although I don't think that it deserves to be built if it doesn't get fully utilized, it just doesn't seem like the best use of resources. I do acknowledge that the demand is growing though and I hope that Yolo County will do its best effort to alleviate some of the dependence on the automobile by allocating some of the induced travel demand to the formerly discussed alternative modes.
34	I would use this path as a place to ride my bicycle for uninterrupted lengths of time away from the busy roadways, though I would continue to use those as well.
35	Keep up the good work...

36	The more types of uses for the path, the wider the path would need to be. If the path were sufficiently wide, surfaced appropriately (DG for horses, smooth paving for cycles, heavier paving for LSV's), and uses are adequately separated to prevent collisions, Great. It is important that we don't build too little path, and then expect too much of it.
37	From #24 to the end makes no sense. I said I do NOT have an LSV
38	In question 16, it's hard to decide what's "very important" because it depends on the quality of the choices. Anyway not getting hit by a car is the major concern.
39	A bike path along Poleline/CR 102 would be ideal in my situation, given that most of my Woodland errands involve either going to the Costco or slightly west towards the shopping center that houses Home Depot. Also having bike access to the nature
40	While 102 looks like the easiest path to follow, because we regularly get pretty high winds it would be helpful to have a path that gives a bit of sheltering to the bikes as well as staying off a very fast traffic pattern.
41	Please get this thing built, and don't put bikes on the shoulder next to county road traffic.
42	My only reservation about combining bicycle and LSV on the same path is that electric LSVs make very little noise and can sneak up on bicycles.
43	Surface condition is probably one of the most critical factors in my decision to use bike paths vs. roads (with or without bike lanes) currently, so it would be important for a new route to feature good road surface, or I wouldn't use it much. Several people I ride with feel the same way. That said, I appreciate your efforts to research this project!
44	I would love to be able to ride my bike to work from Woodland to Davis!!!! As it stands right now, it is WAY TO DANGEROUS on those country rooads.Please build a nice pathway for us.It would save gas,pollution and benefit health!!!!
45	I would like for bikes and LSVs to have separate paths, but I think it would be way too expensive to construct. However, if it is cost effective and it is affordable to have two separate paths, I would support this.
46	I am currently renting in Davis and I am thinking about bying a house. Having a bicycle path separate from the road (fast moving combustion engine driven lanes) would potentially swing my decision towards bying in Woodland. West Sacremanto is the other alternative. There is a bicycle way from there, but it is further, exposed to high winds, and for the most part right next to the highway, which means there is a lot of air pollution. A bicycle way to Woodland would just be absolutely great!!!
47	Maybe 20 years ago I rode my bicycle to Woodland. It was a ghastly experience! There was no clear route, no signage, no bike lane, I wasn't allowed to ride the bus home (with my bike), and I had a flat tire because of thorns on the rode and had to walk the last 2 miles!! Now I drive my car to Woodland. A clear path, with clear signage, and separated from vehicle traffic would be wonderful! I do not now have, and do not plan to buy, any kind of low-speed vehicle; I either walk, bike, or drive my car.
48	Please build it. I used to commute on bike to Woodland and it was not a pleasant experience to commute on Road 102. A dedicated path would be highly utilized!
49	Actually, I don't own a LSV so this page is not applicable.
50	The most important thing is to not build a low-quality path which cracks or warps to become bumpy. If not built as good as a real road, it would be better to just have wider bike lanes along existing roads.
51	I think there is something wrong with the survey after question 17
52	What if Davis built housing that those who work in Davis could afford? Would that reduce the need for this limited utilization facility? This seems somewhat extravegant considering current economic conditions and future economic risks? How do those who's land would be taken for this recreational purpose perceive the necessity for public taking?
53	It is likely in the future that our family will relocate to Woodland. At that time, having an established bicycle route from Woodland to Davis would make it much more feasible for me to continue commuting by bike to my job at UC Davis. As it stands now I would feel uncomfortable commuting between the cities daily, especially when it gets dark earlier.
54	It would be great to have a bike path to Woodland. But I have heard that it might be connected to 113, which would be noisy and unpleasant. I would be more likely to use it if it were like the one that goes out Russell Blvd toward Winters from Davis (alongside of existing county road). Or best of all would be independent of roads entirely, but I understand that option is not being considered.
55	I urge those responsible for selecting origin and destination to select areas that are bicycle friendly to begin with. In other words, don't force bikes to make dangerous trips to access the ATC, and don't have the ATC terminate at locations that are not bicycle safe. I don't consider the Crossroads Mall (great as it is) bicycle safe.
56	Pretty much the only thing holding me back from regularly commuting to work by bicycle is the unavailability of a suitable thruway. The traffic speed and conditions on CR 102/98/etc simply do not lend themselves to safe alternative commuting. This would be a huge benefit to the community!
57	I have considered both LSV and bicycle for commute, but have been afraid to ride in automobile traffic
58	I am planning to move to Woodland and lament that there are no dedicated bike paths. This is something I will really miss after living in Davis.
59	A recreational path between Davis and Woodland would be wonderful. It would open up more longer-distance biking for East Davis.

60	The logic of linking to this last survey page seems wrong. Isn't this intended for current LSV owners. I answered NO to that question. As a current bike rider I am most excited about the development of good quality bike accessible corridors. I would definitely use them on a regular basis. Corridors designed to be LSV accessible would make LSV ownership more attractive.
61	If this were ever to be constructed and it was safe for the whole family to use, it would be an absolute treasure for the 2 towns.
62	When I said no to having a LSV; the survey sent me to question about LSV (I might be brain dead but I'm thinking the logic is 'backwards' but it could be my dyslexia kicking in..
63	This would be a great honor to those whose lives have been taken to early in life that had rode their bikes to and from work. My friend/co-worker, Willie Lopez was tragically struck and killed by a motorist while riding his bike to work on 10.17.07. Thank you for your time.
64	I do not own an LSV as noted on question # 17 but questions # 24-29 seemed to be directed towards LSV owners. How is this survey being distributed?
65	If this corridor happens I will consider purchasing a low speed electric vehicle to supplement my bike. Presently it is too dangerous to travel between Woodland & Davis except by private automoblie or Bus. I pay almost $70/Mo to ferry my bike on Yolo Bus. It is my hope that more people are not killed or injured before we make this corridor a reality.
66	I like the idea of equestrians have a place to ride, but bikes and horses do not mix. Further, I think it's most important to deal with transportation issues, and not many people commute by horse.
67	Why all the questions about LSV when I said I do NOT have such a vehicle?? Survey design error??
68	I would buy an electric vehicle and use it to commute a good fraction of the time if a safe route were available. (I largely gave up regular bike commuting because of the danger of riding Rd. 101, but would probably also bike regularly between the two cities again.)
69	For safety, I think it's imperitive to have a separate pathway away from highway traffic especially at night or during fog. People drive very fast and on the roads there's not much distance from the cars to the edge of the road - and rocks and other debris also fly up. Bikes should be riding facing oncoming traffic so that they can see the hazzard approaching them if you make a path on the edge of the road or highway. I probably wouldn't use to commute but might for pleasure as Woodland is not a safe place to ride a bike at all (traffic moving too fast).
70	Mixing LSV and bicycles/peds is about the stupidest think you could do. Are you serious? Maybe you should evaluate the issues with golf carts other small vehicles operating on bike/ped paths at UC Davis.
71	In the survey, there is no mentioning of the choice of route for adding bike lanes. I think it is important to choose routes that connect major attractions (such as major housing development, shopping areas, and employment).
72	I think the most important thing for either mode is path space. Perhaps a bike lane could be striped on the side of an LSV lane. The problem with typical bike paths is that slow riders and pedestrians clog up the path. If there is only room form bicyclists two abreast then someone has to slow down. If there were room for a typical bike lane on either side of two LSV lanes, bicyclists could navigate around other bicyclists more easily. Hopefully, there would be a little extra room for a bicyclist to pass in the case an LSV needed to share the road at that moment too.
73	I received the same questions twice.
74	I'm not interested in an LSV at all, only really interested in bike routes. I'm concerned about having relatively large/heavy LSV vehicles on the same path as bicycles over this long distance. It would be good to have them be separated...
75	Please connect Pioneer Ln in Woodland to F St. extended along the railroad tracks with a dedicated bike path.
76	It would be best if LSV's, scooters, etc... were separated from bike lanes. Central Park, NYC, has a similar system and it works great. Bikes and pedestrians don't conflict. Directional lanes are marked and users seems to stay in their lane.
77	As a past Davis resident that now lives in Woodland, one of the things I miss is having a safe way to travel by bike from my house to work. Unfortunately, I don't feel safe riding my bike on the roadways between Woodland and Davis and I hope that a safe path for bikers can be created that will promote alternative transportation.
78	A dedicated bike path between Woodland and Davis would encourage more people to use bicycles to travel between the two towns.
79	Dedicated bike/lsv/equestrian path would be very useful. Current route (along CA113 or CoRd99) is not very satisfactory because of the number of cars and agricultural vehicles, and generally bad condition of lanes (because of damage by agri. vehicles), and prevalence of punctures at certain times of year.

Draft Meeting Summary
Alternative Transportation Corridor Dialogue
Yolo County Farm Bureau/Yolo County/City of Davis
Carolyn Penny, Common Ground: Center for Cooperative Solutions, UC Davis, facilitator
July 2, 2009

Participants:
Jim Campbell (Yolo County Public Works), Chris Fong (Community Development, City of Woodland), Ken Hiatt (Deputy City Manager, City of Davis), Rick Landon (Yolo County Agricultural Commissioner), Tim Miramontes (President, Yolo County Farm Bureau), Denise Sagara (Executive Director, Yolo County Farm Bureau), Cindy Tuttle (County-Tribe Coordinator, Yolo County), John Young (Yolo County Chief Deputy Agricultural Commissioner)

Agenda:
2:30 Agenda Review and Introductions
2:50 Briefing on ATC Status and Questions
3:20 Discussion of Farm Bureau Perspectives and Concerns
4:15 Next Steps
4:30 Close

Agriculture Perspectives and Concerns:
Movement of farm equipment

- Signs to watch for farm equipment are ok
- Restricting farm equipment to use of specific roads only is not ok because the ag equipment may need to move further and some fields are accessible from only one road, thus making access imperative.

Trespass concerns/liability

- One grower was told his liability insurance would be cancelled after 1 suit
- A small percentage of people will be the problem – but the liability is a big problem.

Pesticide application

- Aerial application and ground application
- At the time of application and for a period afterwards
- Perception of risk exceeds reality ===> complaints

Vandalism / Theft

- Litter
- Tractors / equipment damaged
- Crop theft

Horses likely to use trail even if not permissible with resulting negative bike/horse/pedestrian interactions
Harassment of livestock
Path Lighting – intrusive on rural area

Attractive nuisance

- I.e. canals for irrigation

Maintenance

- Who will maintain
- Expertise – some chemicals frequently used by cities are inappropriate near crops
- Noxious weed concerns

Landscaping

- Taller trees/shade – intrude on crops
- There would be a need for spray-tolerant landscaping
- Pests-squirrels
- Trees could be a buffer

Wildlife

- Coyotes and foxes may be a problem for dogs

Overall Discussion:

- No additional concerns with NEV use
- Because of SR 113 acts as buffer, Alternative 1 would have the least impact on ag of all 3 options to the degree existing roads are used. If Alternative 1 were selected, defensive plantings such as blackberries and elevation (ditch or raised path) may help address concerns.
- For Alternative 3, keep in mind the impact on Grower's Air, the only aerial application entity in Yolo County.

Possible Ideas to Consider:

- Buffer – 500 feet, via purchase of the property (in which case there would be no ag use of the buffer) or via purchase of an easement with restrictions (in which case there may be ag use of the buffer under certain circumstances)
- Protective planting such as blackberries to serve as a barrier for trespass
- Incentive programs for impacted landowners to offset impacts and to offset increased exposure to liability
- Farm Transitions – smaller u pick or organic
- Consider flood control/water conveyance as an incentive for impacted landowners – Yolo County Flood Control & Water Conservation District would have to be consulted.

Next Steps:

- Carolyn creates summary
- Ken sends meeting summary to participants for review
- Ken sends reviewed summary to consultants to include in feasibility study
- Feasibility study – a paper copy will be sent by CAO's office to Farm Bureau for review by Board
- Denise and Tim will update Farm Bureau Executive Board on this conversation at Executive Board meeting on Monday, July 6, 2009.
- Jim will make sure a copy of feasibility study is also on website
- Jim and Ken will explore water conveyance issue with Yolo County Flood Control (Tim O'Halloran) and others as appropriate.
- Denise will get in touch with Tim O'Halloran next week to give him a heads up about the contact from Jim and Ken.
- For further communication, Denise Sagara is the lead contact for the Farm Bureau (662-6316). Cindy Tuttle (666-8061) is the primary contact for Yolo County; backup is Jim Campbell (666-8847.)

ALT. 1 Bike Only

CR99D - Covell Blvd to CR24A

Input Description	Value
Length - Enter Length of Segment in LF	35591
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
Bridge - Enter SF	2520
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	28	Acre	$10,000	$277,799
2	Grading and Drainage	35591	LF	$5	$177,955
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	21091	CY	$20	$421,819
5	Asphalt Concrete Type A	9135	Ton	$100	$913,502
6	Aggregate Base Class 2	24729	Ton	$40	$989,166
7	Fence/Barrier	71182	LF	$10	$711,820
8	Striping	35591	LF	$1	$35,591
9	Lighting	14	EA	$10,000	$140,000
10	Retaining wall	0	SF	$140	$0
11	Bridge	2520	SF	$150	$378,000
				Subtotal	**$4,045,653**
12	R/W Acquisition	27.78	Acre	$40,000	$1,111,197

Construction Total	**$4,045,653**
R/W Acquisition Total	**$1,111,197**

Yearly Maintenance Costs	Quantity	Unit	Unit Price	Cost/Yr
Pavement	355910	SF	$0.09	**$32,032**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$20,000.00	**$20,000**
Fencing	570	LF	$10.00	**$5,700**
			Total	**$63,752**

ALT. 1 Bike/NEV (Constrained)

CR99D - Covell Blvd to CR24A

Input Description	Value
Length - Enter Length of Segment in LF	35591
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
Bridge - Enter SF	4320
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	36	Acre	$10,000	$359,505
2	Grading and Drainage	35591	LF	$5	$177,955
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	31636	CY	$20	$632,729
5	Asphalt Concrete Type A	14616	Ton	$100	$1,461,604
6	Aggregate Base Class 2	38860	Ton	$40	$1,554,404
7	Fence/Barrier	71182	LF	$10	$711,820
8	Striping	35591	LF	$1	$35,591
9	Lighting	14	EA	$10,000	$140,000
10	Retaining wall	0	SF	$140	$0
11	Bridge	4320	SF	$150	$648,000
				Subtotal	**$5,721,608**
12	R/W Acquisition	35.95	Acre	$40,000	$1,438,020

Construction Total	**$5,721,608**
R/W Acquisition Total	**$1,438,020**

Yearly Maintenance Costs	**Quantity**	**Unit**	**Unit Price**	**Cost/Yr**
Pavement	569456	SF	$0.09	**$51,251**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$20,000.00	**$20,000**
Fencing	570	LF	$10.00	**$5,700**
			Total	**$82,971**

ALT. 1 Bike/NEV (UnConstrained)

CR99D - Covell Blvd to CR24A

Input Description	Value
Length - Enter Length of Segment in LF	35591
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
Bridge - Enter SF	5400
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	41	Acre	$10,000	$408,528
2	Grading and Drainage	35591	LF	$5	$177,955
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	36909	CY	$20	$738,184
5	Asphalt Concrete Type A	20097	Ton	$100	$2,009,705
6	Aggregate Base Class 2	45926	Ton	$40	$1,837,023
7	Fence/Barrier	71182	LF	$10	$711,820
8	Striping	71182	LF	$1	$71,182
9	Lighting	14	EA	$10,000	$140,000
10	Retaining wall	0	SF	$140	$0
11	Bridge	5400	SF	$150	$810,000
				Subtotal	**$6,904,397**
13	R/W Acquisition	40.85	Acre	$40,000	$1,634,114

Construction Total	**$6,904,397**
R/W Acquisition Total	**$1,634,114**

Yearly Maintenance Costs	Quantity	Unit	Unit Price	Cost/Yr
Pavement	783002	SF	$0.09	**$70,470**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$20,000.00	**$20,000**
Fencing	570	LF	$10.00	**$5,700**
			Total	**$102,190**

ALT. 2 Bike Only

CR 101A (East Side of CNRR) - Covell Blvd to CR 29

Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
Bridge - Enter SF	910
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	8.57	Acre	$10,000	$85,742
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	6510	CY	$20	$130,193
5	Asphalt Concrete Type A	2819	Ton	$100	$281,948
6	Aggregate Base Class 2	7633	Ton	$40	$305,302
7	Fence/Barrier	21970	LF	$10	$219,700
8	Striping	10985	LF	$1	$10,985
9	Bridge	910	SF	$150	$136,500
				Subtotal	**$1,225,294**
10	R/W Acquisition	8.57	Acre	$20,000	$171,483

(CR 101A East Side of CNRR) CR 29 to CNRR (CUL-DE-SAC)

Length - Enter Length of Segment in LF	16432
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
Bridge - Enter SF	3080
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	12.83	Acre	$10,000	$128,257
2	Grading and Drainage	16432	LF	$5	$82,160
3	Ditch Excavation	10955	CY	$30	$328,640
4	Embankment	9737	CY	$20	$194,750
5	Asphalt Concrete Type A	4218	Ton	$100	$421,755
6	Aggregate Base Class 2	11417	Ton	$40	$456,688
7	Fence/Barrier	32864	LF	$10	$328,640
8	Striping	16432	LF	$1	$16,432
9	Retaining Wall (under SR 113)	1200	SF	$140	$168,000
10	Bridge	3080	SF	$150	$462,000
				Subtotal	**$2,587,321**
11	R/W Acquisition	12.83	Acre	$20,000	$256,514

(East Side of CNRR) CUL-DE-SAC to CR 25A

Input Description	**Value**
Length - Enter Length of Segment in LF	1950
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	1.52	Acre	$10,000	$15,220
2	Grading and Drainage	1950	LF	$5	$9,750
3	Ditch Excavation	2600	CY	$30	$78,000
4	Embankment	1156	CY	$20	$23,111
5	Asphalt Concrete Type A	501	Ton	$100	$50,050
6	Aggregate Base Class 2	968	Ton	$40	$38,711
7	Fence/Barrier	1950	LF	$10	$19,500
8	Striping	1950	LF	$1	$1,950
				Subtotal	**$236,293**
9	R/W Acquisition	1.52	Acre	$20,000	$30,441

(west Side of CNRR) CR 25A toCR 24A

Input Description	**Value**
Length - Enter Length of Segment in LF	5275
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	4.12	Acre	$10,000	$41,173
2	Grading and Drainage	5275	LF	$5	$26,375
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	3126	CY	$20	$62,519
5	Asphalt Concrete Type A	1354	Ton	$100	$135,392
6	Aggregate Base Class 2	2618	Ton	$40	$104,719
7	Fence/Barrier	0	LF	$10	$0
8	Striping	15825	LF	$1	$15,825
9	Lighting	14	EA	$10,000	$140,000
				Subtotal	**$526,002**
11	R/W Acquisition	4.12	Acre	$20,000	$82,346

Construction Total	**$4,574,910**
R/W Acquisition Total	**$540,784**

Yearly Maintenance Costs	**Quantity**	**Unit**	**Unit Price**	**Cost/Yr**
Pavement	326920	SF	$0.09	**$29,423**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$15,000.00	**$15,000**
Fencing	460	LF	$10.00	**$4,600**
			Total	**$55,043**

ALT. 2 Bike/NEV (Constrained)

(CR 101A East Side of CNRR) - Davis City Limit Boundary to CR 29

Input Description	Value
Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
Bridge - Enter SF	1560
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	11	Acre	$10,000	$110,960
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	9764	CY	$20	$195,289
5	Asphalt Concrete Type A	4511	Ton	$100	$451,117
6	Aggregate Base Class 2	11994	Ton	$40	$479,760
7	Fence/Barrier	10985	LF	$10	$109,850
8	Striping	10985	LF	$1	$10,985
9	Bridge	1560	SF	$150	$234,000
				Subtotal	**$1,646,886**
10	R/W Acquisition	11.10	Acre	$20,000	$221,919

(CR 101A East Side of CNRR) CR 29 to CNRR (CUL-DE-SAC)

Input Description	Value
Length - Enter Length of Segment in LF	16432
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
Bridge - Enter SF	5260

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	17	Acre	$10,000	$165,980
2	Grading and Drainage	16432	LF	$5	$82,160
3	Ditch Excavation	10955	CY	$30	$328,640
4	Embankment	14606	CY	$20	$292,124
5	Asphalt Concrete Type A	6748	Ton	$100	$674,807
6	Aggregate Base Class 2	17941	Ton	$40	$717,652
7	Fence/Barrier	32864	LF	$10	$328,640
8	Striping	16432	LF	$1	$16,432
9	Retaining Wall (at SR 113)	1200	SF	$140	$168,000
10	Bridge	5260	SF	$150	$789,000
				Subtotal	**$3,563,436**
11	R/W Acquisition	16.60	Acre	$20,000	$331,960

(East Side of CNRR) CUL-DE-SAC to 25A

Input Description	Value
Length - Enter Length of Segment in LF	1950
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	1.97	Acre	$10,000	$19,697
2	Grading and Drainage	1950	LF	$5	$9,750
3	Ditch Excavation	1300	CY	$30	$39,000
4	Embankment	1733	CY	$20	$34,667
5	Asphalt Concrete Type A	801	Ton	$100	$80,080
6	Aggregate Base Class 2	2129	Ton	$40	$85,164
7	Fence/Barrier	1950	LF	$10	$19,500
8	Striping	1950	LF	$1	$1,950
				Subtotal	**$289,808**
9	R/W Acquisition	1.97	Acre	$20,000	$39,394

(West Side of CNRR) CR 25A toCR 24A

Input Description	Value
Length - Enter Length of Segment in LF	5275
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	5.33	Acre	$10,000	$53,283
2	Grading and Drainage	5275	LF	$5	$26,375
3	Ditch Excavation	3517	CY	$30	$105,500
4	Embankment	4689	CY	$20	$93,778
5	Asphalt Concrete Type A	2166	Ton	$100	$216,627
6	Aggregate Base Class 2	5760	Ton	$40	$230,381
7	Fence/Barrier	5275	LF	$10	$52,750
8	Striping	5275	LF	$1	$5,275
9	Lighting	14	EA	$10,000	$140,000
				Subtotal	**$923,968**
10	R/W Acquisition	5.33	Acre	$20,000	$106,566

Construction Total	**$6,424,098**
R/W Acquisition Total	**$699,838**

Yearly Maintenance Costs	Quantity	Unit	Unit Price	Cost/Yr
Pavement	554272	SF	$0.09	**$49,884**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$15,000.00	**$15,000**
Fencing	410	LF	$10.00	**$4,100**
			Total	**$75,004**

ALT. 2 Bike/NEV (UnConstrained)

(CR 101A East Side of CNRR) - Davis City Limit Boundary to CR 29

Input Description	Value
Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
Bridge - Enter SF	1950
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	13	Acre	$10,000	$126,090
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	0	CY	$30	$0
4	Embankment	11392	CY	$20	$227,837
5	Asphalt Concrete Type A	6203	Ton	$100	$620,286
6	Aggregate Base Class 2	14175	Ton	$40	$566,989
7	Fence/Barrier	10985	LF	$10	$109,850
8	Striping	21970	LF	$1	$21,970
9	Bridge	1950	SF	$150	$292,500
				Subtotal	**$2,020,448**
10	R/W Acquisition	12.61	Acre	$20,000	$252,181

(CR 101A East Side of CNRR) CR 29 to CNRR (CUL-DE-SAC)

Input Description	Value
Length - Enter Length of Segment in LF	16432
Clear and Grub - Enter width of c&g required (LF)	50
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
Bridge - Enter SF	6600
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	19	Acre	$10,000	$188,613
2	Grading and Drainage	16432	LF	$5	$82,160
3	Ditch Excavation	10955	CY	$30	$328,640
4	Embankment	17041	CY	$20	$340,812
5	Asphalt Concrete Type A	9279	Ton	$100	$927,860
6	Aggregate Base Class 2	21203	Ton	$40	$848,135
7	Fence/Barrier	32864	LF	$10	$328,640
8	Striping	16432	LF	$1	$16,432
9	Retaining Wall (at SR 113)	1200	SF	$140	$168,000
10	Bridge	6600	SF	$150	$990,000
				Subtotal	**$4,219,292**
11	R/W Acquisition	18.86	Acre	$20,000	$377,227

(East Side of CNRR) CUL-DE-SAC to 25A

Input Description	Value
Length - Enter Length of Segment in LF	1950
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	2.24	Acre	$10,000	$22,383
2	Grading and Drainage	1950	LF	$5	$9,750
3	Ditch Excavation	1300	CY	$30	$39,000
4	Embankment	2022	CY	$20	$40,444
5	Asphalt Concrete Type A	1101	Ton	$100	$110,110
6	Aggregate Base Class 2	2516	Ton	$40	$100,649
7	Fence/Barrier	1950	LF	$10	$19,500
8	Striping	1950	LF	$1	$1,950
				Subtotal	**$343,786**
10	R/W Acquisition	2.24	Acre	$20,000	$44,766

(West Side of CNRR) CR 25A toCR 24A

Input Description	Value
Length - Enter Length of Segment in LF	5275
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	6	Acre	$10,000	$60,549
2	Grading and Drainage	5275	LF	$5	$26,375
3	Ditch Excavation	7033	CY	$30	$211,000
4	Embankment	5470	CY	$20	$109,407
5	Asphalt Concrete Type A	2979	Ton	$100	$297,862
6	Aggregate Base Class 2	6807	Ton	$40	$272,268
7	Fence/Barrier	5275	LF	$10	$52,750
8	Striping	5275	LF	$1	$5,275
9	Lighting	14	EA	$10,000	$140,000
				Subtotal	**$1,175,486**
10	R/W Acquisition	6.05	Acre	$20,000	$121,097

Construction Total	**$7,759,012**
R/W Acquisition Total	**$795,271**

Yearly Maintenance Costs	Quantity	Unit	Unit Price	Cost/Yr
Pavement	762124	SF	$0.09	**$68,591**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$15,000.00	**$15,000**
Fencing	410	LF	$10.00	**$4,100**
			Total	**$93,711**

ALT. 3 Bike Only

(CR 101A West Side of CNRR) - Covell Blvd to CR 29

Input Description	Value
Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
Bridge - Enter SF	910
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	9	Acre	$10,000	$85,742
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	7323	CY	$30	$219,700
4	Embankment	6510	CY	$20	$130,193
5	Asphalt Concrete Type A	2819	Ton	$100	$281,948
6	Aggregate Base Class 2	7633	Ton	$40	$305,302
7	Fence/Barrier	21970	LF	$10	$219,700
8	Striping	10985	LF	$1	$10,985
9	Bridge	910	SF	$150	$136,500
				Subtotal	**$1,444,994**
10	R/W Acquisition	8.57	Acre	$20,000	$171,483

CR 29 (East Side of CNRR) to CR 27 to CR 101 to Woodland City Limits

Input Description	Value
Length - Enter Length of Segment in LF	24200
Width AC - Enter Width of New AC in LF	10
Width AB - Enter Width of New AB in LF	14
Bridge - Enter SF	3080
RW - Enter width of new RW required (LF)	34

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	19	Acre	$10,000	$188,889
2	Grading and Drainage	24200	LF	$5	$121,000
3	Ditch Excavation	16133	CY	$30	$484,000
4	Embankment	14341	CY	$20	$286,815
5	Asphalt Concrete Type A	6211	Ton	$100	$621,133
6	Aggregate Base Class 2	16815	Ton	$40	$672,581
7	Fence/Barrier	48400	LF	$10	$484,000
8	Striping	24200	LF	$1	$24,200
9	Lighting	14	EA	$10,000	$140,000
10	Retaining Wall	0	SF	$140	$0
11	Bridge	3080	SF	$150	$462,000
				Subtotal	**$3,484,618**
12	R/W Acquisition	18.89	Acre	$20,000	$377,778

Construction Total	**$4,929,612**
R/W Acquisition Total	**$549,261**

Yearly Maintenance Costs	**Quantity**	**Unit**	**Unit Price**	**Cost /Yr**
Pavement	351850	SF	$0.09	**$31,667**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$10,000.00	**$10,000**
Fencing	570	LF	$10.00	**$5,700**
			Total	**$53,387**

ALT. 3 Bike/NEV Constrained

CR 101A (F ST) - Covell Blvd to CR 29 (East Side of CNRR)

Input Description	Value
Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
Bridge - Enter SF	1560
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	11	Acre	$10,000	$110,960
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	7323	CY	$30	$219,700
4	Embankment	9764	CY	$20	$195,289
5	Asphalt Concrete Type A	4511	Ton	$100	$451,117
6	Aggregate Base Class 2	11994	Ton	$40	$479,760
7	Fence/Barrier	10985	LF	$10	$109,850
8	Striping	10985	LF	$1	$10,985
9	Bridge	1560	SF	$150	$234,000
				Subtotal	**$1,866,586**
10	R/W Acquisition	11.10	Acre	$20,000	$221,919

CR 29 (East Side of CNRR) to CR 27 to CR 101 to Woodland City Limits

Input Description	Value
Length - Enter Length of Segment in LF	24200
Width AC - Enter Width of New AC in LF	16
Width AB - Enter Width of New AB in LF	22
Fence - Enter 0 for no, 1 for 1 side, 2 for 2 sides	2
Striping - Enter # of Stripes	1
Bridge - Enter SF	5280
RW - Enter width of new RW required (LF)	44

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	24	Acre	$10,000	$244,444
2	Grading and Drainage	24200	LF	$5	$121,000
3	Ditch Excavation	16133	CY	$30	$484,000
4	Embankment	21511	CY	$20	$430,222
5	Asphalt Concrete Type A	9938	Ton	$100	$993,813
6	Aggregate Base Class 2	26423	Ton	$40	$1,056,913
7	Fence/Barrier	48400	LF	$10	$484,000
8	Striping	24200	LF	$1	$24,200
9	Lighting	14	EA	$10,000	$140,000
10	Retaining Wall	0	SF	$140	$0
11	Bridge	5280	SF	$150	$792,000
				Subtotal	**$4,770,593**
12	R/W Acquisition	24.44	Acre	$20,000	$488,889

Construction Total	**$6,637,178**
R/W Acquisition Total	**$710,808**

Yearly Maintenance Costs	**Quantity**	**Unit**	**Unit Price**	**Cost/Yr**
Pavement	562960	SF	$0.09	**$50,666**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$10,000.00	**$10,000**
Fencing	480	LF	$10.00	**$4,800**
			Total	**$71,486**

ALT. 3 Bike/NEV UnConstrained

CR 101A (F ST) - Covell Blvd to CR 29 (East Side of CNRR)

Input Description	Value
Length - Enter Length of Segment in LF	10985
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
Bridge - Enter SF	1950
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	13	Acre	$10,000	$126,090
2	Grading and Drainage	10985	LF	$5	$54,925
3	Ditch Excavation	7323	CY	$30	$219,700
4	Embankment	11392	CY	$20	$227,837
5	Asphalt Concrete Type A	6203	Ton	$100	$620,286
6	Aggregate Base Class 2	14175	Ton	$40	$566,989
7	Fence/Barrier	10985	LF	$10	$109,850
8	Striping	21970	LF	$1	$21,970
9	Bridge	1950	SF	$150	$292,500
				Subtotal	**$2,240,148**
10	R/W Acquisition	12.61	Acre	$20,000	$252,181

CR 29 (East Side of CNRR) to CR 27 to CR 101 to Woodland City Limits

Input Description	Value
Length - Enter Length of Segment in LF	24200
Width AC - Enter Width of New AC in LF	22
Width AB - Enter Width of New AB in LF	26
Fence - Enter 0 for no, 1 for 1 side, 2 for 2 sides	2
Striping - Enter # of Stripes	2
Bridge - Enter SF	6600
RW - Enter width of new RW required (LF)	50

Cost Summary

		Quantity	Unit	Unit Price	Total
1	Clearing and Grubbing	28	Acre	$10,000	$277,778
2	Grading and Drainage	24200	LF	$5	$121,000
3	Ditch Excavation	16133	CY	$30	$484,000
4	Embankment	25096	CY	$20	$501,926
5	Asphalt Concrete Type A	13665	Ton	$100	$1,366,493
6	Aggregate Base Class 2	31227	Ton	$40	$1,249,079
7	Fence/Barrier	48400	LF	$10	$484,000
8	Striping	48400	LF	$1	$48,400
9	Lighting	14	EA	$10,000	$140,000
10	Retaining Wall	0	SF	$140	$0
11	Bridge	6600	SF	$150	$990,000
				Subtotal	**$5,662,676**
12	R/W Acquisition	27.78	Acre	$20,000	$555,556

Construction Total	**$7,902,823**
R/W Acquisition Total	**$807,736**

Yearly Maintenance Costs	**Quantity**	**Unit**	**Unit Price**	**Cost/Yr**
Pavement	774070	SF	$0.09	**$69,666**
Electrical	14	EA	$180.00	**$2,520**
Weed Control	1	LS	$3,500.00	**$3,500**
Path Closure	1	LS	$10,000.00	**$10,000**
Fencing	480	LF	$10.00	**$4,800**
			Total	**$90,486**

memorandum

date June 9, 2009

to Leo Rubio, Project Director
Bennett Engineering Services
1082 Sunrise Ave., Suite 100
Roseville, CA 95661

from Ray Weiss
Environmental Science Associates

subject Davis Alternative Transportation Corridor Project – Constraints Analysis Memorandum

Introduction

The purpose of this memorandum is to identify the biological resources that exist on the project site and discuss how related constraints may affect project planning associated with the proposed Davis Alternative Transportation Corridor Project (Project). This memo is not intended for purposes of fulfilling California Environmental Quality Act (CEQA) requirements or use in the application for project permits, but as a tool for use during initial project planning. Implementation of the proposed project will require additional focused biological surveys of which the results can be used for the preparation of a CEQA document, permit applications, and agency consultation.

Project Description and Options

The project is comprised of three options which include:

- **Option #1:** This option would be constructed on the west side of State Route 113 north from the City of Davis to the south edge of the City of Woodland. The south end of the alignment begins approximately 0.3-mile south of Barry Road, in Davis and follows State Route 113 north along the County Road 29 exit, across Willow Slough north utilizing the existing Myrtle Lane roadway. It then continues north along the County Road 27 exit along Rose Lane utilizing the existing road, then north along the west side of East Road to its terminus at Corporate Limit, on the south edge of the City of Woodland. This option would utilize existing, low traffic roads where feasible for efficiency (Myrtle Lane and Rose Lane) and possibly expand existing right of ways (East Road). Land acquisition or easement of adjacent agricultural land along this option would provide the capability for widening existing roads to allow for alternative transportation. Major site improvements would include grading, earthwork, paving, and design.

- **Option #2:** This option would be constructed on the east side of the Southern Pacific Railroad (SPRR) north from the City of Davis, to the south edge of the City of Woodland. The south end of the alignment begins approximately at the intersection of Covell Boulevard and the SPRR in Davis and follows the east side of the SPRR north across County Road 29, across Willow Slough, then across County Road 27. Option 2 runs along the east side of the SPRR until the start of East Street where it

will run under the existing SPRR overpass. Option 2 then matches the Option 1 proposed alignment and follows the west side of East Street to its terminus at Corporate Limit, on the south edge of the City of Woodland. This option would expand existing County Road 101 and East Street right of ways where feasible for efficiency. Land acquisition or easement of adjacent agricultural land along this option would provide the capability for widening existing roads to allow for alternative transportation. Major site improvements would include grading, earthwork, paving, and design.

- **Option #3:** This option would be constructed on the east side of the SPRR north from the City of Davis, to the intersection of County Road 25a and County Road 101. The south end of the alignment begins approximately at the intersection of Covell Boulevard and the SPRR in Davis and follows the east side of the SPRR north across County Road 29, across Willow Slough, then across County Road 27. Option 3 then runs east along the north side of County Road 27 then cuts north through the south east corner of an agricultural field then follows the east side of County Road 101 where it terminates at the intersection of County Road 101 and County Road 25a. This option would expand existing County Road 101, County Road 27, and County Road 25a right of ways where feasible for efficiency. Land acquisition or easement of adjacent agricultural land along this option would provide the capability for widening existing roads to allow for alternative transportation. Major site improvements would include grading, earthwork, paving, and design.

Summary of Sensitive Biological Resources from the Baseline Memo

Sensitive resources and special-status species observed in the project area are described below (**Figure 5**).

- Riverine habitat (Dry and Willow Slough and various road-side ditches) exists within all three project options (**Figure 5, Photo 1 and 2**).
- Agricultural ditches that may provide suitable habitat for giant garter snake exist within all three project options (**Figure 5, Photos 1 and 2**)
- Valley foothill riparian habitat exists along Dry and Willow Slough within all three project alternatives (**Figure 5, Photo 3 and 4**).
- Blue elderberry shrubs are present within and/or adjacent to (within 100 feet) all three project options and if stems are greater than 1" diameter at ground level may provide suitable breeding habitat for the valley elderberry longhorn beetle (**Figure 5, Photo 5 and 6**).
- A pair of Swainson's hawks exhibiting nesting behavior were observed perched next to a nest in a small tree just south of the intersection of options 1 and 2 (**Figure 5, Photo 7**).
- White-tailed kite was observed within option 1 and a northern harrier was observed within both options 1 and 2 project areas (**Figure 5, Photo 8 and 9**).

No other sensitive species or natural communities identified above would be expected to be encountered within the study area. Focused wildlife, plant and habitat surveys must be conducted within and adjacent to the project area prior to construction to determine existence of special-status species and natural communities that may occur within the study area.

Regulatory and Permitting Constraints

Potential and required permitting to implement the three proposed options are influenced by impacts to natural resources, including sensitive natural plant communities, special-status plant and wildlife species, wetlands and other waters of the U.S. Permit requirements will include mitigation in the form of on-site restoration where feasible or offsite mitigation. Off-site mitigation can take the form of purchasing mitigation bank credits, in-lieu fees or long-term mitigation and monitoring. All of these mitigation types will require financial expenditures based upon the level of permanent and temporary impacts.

The following is a brief description of the reason for the required permits, their associated fees, and anticipated timelines for acquiring the permits.

Section 404 CWA Permit and Section 7 Endangered Species Act Compliance: Based on database searches and a reconnaissance-level site inspection, potentially jurisdictional features do occur within the vicinity of the proposed option limits of disturbance in the form of drainage ditches and perennial creeks (Willow and Dry Sloughs). Although these features have not been verified by the Corps, they will likely fall under the jurisdictional purview of the Corps. Based upon ESA's understanding of the proposed project, it would directly impact drainage ditches, and perennial creeks within the limits of disturbance. Impacts to these resources through implementation of the project would be significant, thus a Section 404 permit would be required from the Corps.

If the project qualifies for coverage under a Nationwide Permit (NWP) (impacts to less than 0.5 acres), the Corps has 30-days to notify the applicant as to whether the application is complete and initiate Section 7 consultation U.S. Fish and Wildlife Service thereby complying with Section 7 of the Endangered Species Act. If USFWS determines that the action is not likely to adversely affect listed species, it will provide concurrence in writing by issuing a letter of no effect and no further consultation is required. Although a timeframe for responding to these requests is not mandated by regulation, the USFWS will respond within 30 calendar days when possible. The entire review process for approval of a NWP when the action is not likely to adversely affect listed species could normally take 30-45 days. However, due to limited staffing and resources, agency approval could take up to 90 days or more.

If the USFWS deems that the project could result in adverse impacts to the species, then a formal consultation process would be initiated involving the preparation of a Biological Assessment for use by USFWS to issue a Biological Opinion (BO). The BO will contain the determination of whether proposed activities would jeopardize the species or its habitat and, if it is deemed so, must identify any reasonable and prudent alternatives that could allow the project to move forward. The entire review process when the action is likely to adversely affect listed species could take up to 145 days. There is no fee for the Section 404 and Section 7 review and application process.

Section 401 CWA Permit: Potential impacts (discharge of dredged or fill material) to wetlands and waters of the U.S. would require a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB) would. Projects with a "Low Impact" (temporary or permanent) that fill less than or equal to 0.1 acre, 200 lineal feet, or 25 cubic yards require a flat fee of $500.00. Projects with total impacts (temporary or permanent) greater than 0.1 acre, 200 lineal feet, or 25 cubic yards are not "Low Impact" and require additional fee(s) as determined in the Fee Calculator found on the State Water Resources Control

Board website. A Section 401 permit can be expected to be issued between two to four months from the time the RWQCB receives the permit application.

Section 1600 Streambed and Lakebed Alteration Agreement: A streambed and lakebed alteration agreement (SAA), in compliance with Section 1602 of the California Fish and Game Code, is required when projects will substantially divert, obstruct, or change the natural flow of a river, stream or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. An application fee as determined by the DFG Fees for Lake and Streambed Alteration Agreements (Cal. Code Regs., tit. 14, § 699.5) is required and will be dependent upon the cost of the project. Upon submittal of the SAA, CDFG has 30 days in which to provide notification in writing whether the application is complete and the applicant would then have 14 days to submit in writing to the DFG that they accept the measures. If there are no adverse impacts to resources the review and approval process could require 30 to 45 days for completion. If there are adverse impacts to resources the review and approval process could require 60 days for completion.

Surveys: In addition to permit acquisition, numerous surveys may be required prior to project approval and/or onset of construction activities. These surveys must be conducted during specific times of the year and may impact the construction schedule. A wetland delineation should be performed before or concurrently with the Section 404 permit application and during the spring. Rare plant surveys are generally performed during early spring and may require two sets of surveys; timing will depend upon the species identified as having potential to occur on the project site. California tiger salamander surveys may be required which can result in two seasons of surveys. California red-legged frog surveys must be conducted during the rainy season and over several weeks. Nesting surveys must be conducted two week priors to construction and if an active nest is found, may require a no-work buffer around the nest.

Table 1 below identifies which permits and special-status species surveys may be required for each option. As previously described, this evaluation is based on a review of aerial photography and reconnaissance level surveys of the project study area and alignment options. Further refinement of the options and additional site specific surveys may likely reduce the scope of the surveys identified below in Table 1. Project design features (including avoidance or spanning of study area wetlands or waterways) may also reduce the need to obtain several of the regulatory permits identified in Table 1.

Table 1
Environmental Permitting and Survey Requirements

Biological Resources	**Option 1**	**Option 2**	**Option 3**
Habitats Present	Annual Grassland or Pasture	Annual Grassland or Pasture	Annual Grassland or Pasture
	Cropland	Cropland	Cropland
	Ruderal	Ruderal	Ruderal
	Urban	Urban	Urban
	Valley Foothill Riparian	Valley Foothill Riparian	Valley Foothill Riparian
	Riverine	Riverine	Riverine
	Vineyard	Vineyard	

Table 1
Environmental Permitting and Survey Requirements

Biological Resources	Option 1	Option 2	Option 3
Survey(s) that may be Required	nesting raptor and songbird	nesting raptor and songbird	nesting raptor and songbird
	giant garter snake	giant garter snake	giant garter snake
	valley elderberry longhorn beetle/elderberry shrub	valley elderberry longhorn beetle/elderberry shrub	valley elderberry longhorn beetle/elderberry shrub
	California tiger salamander	California tiger salamander	California tiger salamander
	California red-legged frog	California red-legged frog	California red-legged frog
	bat	bat	bat
	rare plant	rare plant	rare plant
	wetland delineation	wetland delineation	wetland delineation
	Habitat/sensitive natural community mapping	habitat/sensitive natural community mapping	habitat/sensitive natural community mapping
Permitting Requirements	Obtain Section 404 (Clean Water Act) permit from U.S. Army Corps of Engineers (Corps)	Obtain Section 404 (Clean Water Act) permit from U.S. Army Corps of Engineers (Corps)	Obtain Section 404 (Clean Water Act) permit from U.S. Army Corps of Engineers (Corps)
	Obtain Streambed Alteration Agreement from CDFG under Sections 1601-1616 of the CA Department of Fish and Game Code	Obtain Streambed Alteration Agreement from CDFG under Sections 1601-1616 of the CA Department of Fish and Game Code	Obtain Streambed Alteration Agreement from CDFG under Sections 1601-1616 of the CA Department of Fish and Game Code
	Obtain Section 401 CWA permit from the Regional Water Quality Control Board.	Obtain Section 401 CWA permit from the Regional Water Quality Control Board.	Obtain Section 401 CWA permit from the Regional Water Quality Control Board.
Potential Permitting Requirements	Consultation with USFWS under Section 7 of the Federal Endangered Species Act (FESA)	Consultation with USFWS under Section 7 of the Federal Endangered Species Act (FESA)	Consultation with USFWS under Section 7 of the Federal Endangered Species Act (FESA)
	Management agreement with CDFG under the California Endangered Species Act (CESA)	Management agreement with CDFG under the California Endangered Species Act (CESA)	Management agreement with CDFG under the California Endangered Species Act (CESA)

Source: USFWS, 2009; DFG, 2009; RWQCB, 2009; and ESA, 2009.

Conclusions

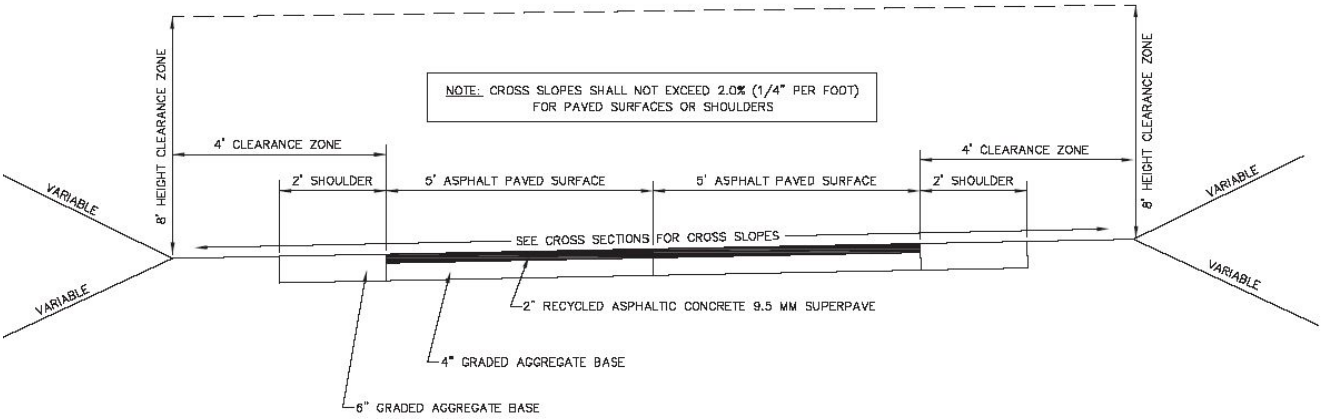
The following constraints criteria have been developed to evaluate each of the three proposed options for the Davis Alternative Transportation Corridor Project.

- ***High Constraint*** if the project implementation could result in direct impacts to sensitive species or habitats.
- ***Moderate Constraint*** if the project implementation could directly impact common wildlife and result in temporary indirect impacts to protected species such as nesting raptors.
- ***Low Constraint*** if the project implementation would not directly or indirectly impact biological resources.

Based on the above analysis:

- **Option 1** is expected to have a ***high constraint*** on sensitive species and habitats in the study area;
- **Option 2** is expected to have a ***high constraint*** on sensitive species and habitats in the study area;
- **Option 3** is expected to have a ***high constraint*** on sensitive species and habitats in the study area.

Peachtree City Cross Section Detail



TYPICAL MULTI-USE PATH SECTION

Courtesy of David A. Borkowski, P.E., M.ASCE, Peachtree City Engineer

10' path with 4' clear zone on side

Path going over a multi-use tunnel

Please refer to page 21 of the May 2009 Existing Conditions Memorandum for a summary of Peachtree City's multi-use pathway system.

Appendix H
Presentation: ***Research Insights for NEVs on a Davis-Woodland Low Speed Corridor***

The following was provided by the jurisdictions to the Project Team to include in this Study. The Project Team members did not attend this presentation.

Institute of Transportation Studies
University of California, Davis

Research Insights for NEVs on a Davis-Woodland low speed corridor

Joshua Cunningham
September 15, 2008

ITS UCDAVIS

Electric Vehicle Categories & Products

- http://www.arb.ca.gov/msprog/zevprog/zevprog.htm
- http://www.driveclean.ca.gov/searchresults_by_tech.php?tech=37
- NEVs
  - Max speed of 25 mph, roads with speed limit of 35 mph
  - GEM e4: 30 mile range, $10,000 price
- City EVs
  - Small vehicle platform, but highway speed capable
  - Think EV (current EU production vehicle)
  - Recent automotive announcements:
    - Daimler Smart EV – Production begins in 2010
    - Mitsubushi iMEV – Production begins in 2010
    - Nissan Cube – Pre production in 2010, full production in 2012

City EVs

Market Perspectives on NEVs

- Current incentives in CA
  - PG&E discount rate for EV charging
  - CARB Fueling Alternatives Alternative Fuel Vehicle Rebate Program ($1,250 for GEMs)
  - Possible future incentives: free parking, no-gasoline/diesel city zones (London), purchase tax breaks, solar panel special rebate
- Vehicle usage (Davis, Woodland cases)
  - NEVs, being low speed, need safe roads to operate
    - Popular in Davis, but is comfort level there on Woodland streets?
  - NEV range – 2/3 of range needed in D-W commute alone, only leaves 10 miles for in Davis & Woodland
  - City EVs – perfect for within city and short commutes (Davis-Woodland); safer on wider range of roads

Market Perspectives on NEVs

- Purchase decisions
  - Vehicle price is high, consumer needs to "want" EV benefits (zero emissions, quiet, no gasoline, etc)
  - Incentives such as LSV corridor access, or free parking, are "extra benefits" but will not likely drive purchase decisions

What technology is coming next?

- All these options are on full size vehicle platforms
- Cheaper, better hybrids (HEVs)
  - Honda, Toyota, others unveiling new cars in 2009
- Plug-in HEVS (PHEVs)
  - Toyota & GM plan production in 2010/2011
  - Basically an HEV but with ability to plug in to grid
- Biofuels
  - 5% ethanol exists today in all gasoline sold
  - E85 or B100 not likely to ever be large market
- Fuel Cell Vehicles
  - Production vehicles will emerge in 2015 at the earliest
  - Honda FCX Clarity the most advanced vehicle
  - Dependent on hydrogen infrastructure, government cost incentives

ITS-Davis Researchers in this area

- Dan Sperling
  - Director, ITS-Davis; CARB Chairman
  - Research of public policies for alternative fuels and vehicles
  - http://www.its.ucdavis.edu/people/faculty/sperling/index.php
- Susan Handy
  - Director, Sustainable Transportation Center (STC), part of ITS-Davis
  - Research of relationship between transportation and land-use
  - http://www.des.ucdavis.edu/faculty/handy/
- Ken Kurani
  - Research Engineer, ITS-Davis
  - Research of user responses to new transportation alternatives
  - http://www.its.ucdavis.edu/people/faculty/kurani/index.php
- Andy Burke
  - Research Engineer, ITS-Davis
  - Research of advanced batteries and hybrid electric vehicle configurations
  - http://www.its.ucdavis.edu/people/faculty/burke/index.php

ITS-Davis Related Publications

- **http://pubs.its.ucdavis.edu/**
- Ted Buehler, "50 Years of Bicycling in Davis, California", perspectives on why Davis bicycling thrived and what current trends look like, February 2007.
- Ken Kurani, "Household Markets for Neighborhood Electric Vehicles in California," UCD-ITS-RR-95-06, May 2005.
- Tim Lipman, "Incentive Policies for Neighborhood Electric Vehicles," UCD-ITS-RR-94-20, August 1994.
- Mark Delucchi, "How we can have safe, convenient, clean, affordable, pleasant transportation without making people drive less or give up suburban living (PASSTOWN)," UCD-ITS-RR-02-08, Sept 2002.
- Susan Handy, "Driving by Choice or Necessity?" UCD-ITS-RP-05-29, March 2005.
- Reid Ewing, "Identifying and Measuring Urban Design Qualities Related to Walkability," UCD-ITS-RP-06-08, January 2006.