



SOUTHERN CALIFORNIA



ASSOCIATION of GOVERNMENTS



Western Riverside Council Of Governments 4-City Neighborhood Electric Vehicle Transportation Plan

CORONA ▪ NORCO ▪ RIVERSIDE ▪ MORENO VALLEY

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NOTICES

This is a project of the Western Riverside Council of Governments with funding provided by the Southern California Association of Governments' (SCAG) Compass Blueprint Demonstration Project Program. Compass Blueprint assists Southern California cities and other organizations in evaluating planning options and stimulating development consistent with the region's goals.

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Executive Summary

Purpose

Neighborhood Electric Vehicles (NEV) provide a low speed, zero emission transportation option that can assist communities and regions in improving mobility while reducing carbon-based vehicle emissions and related pollution. Plans are needed to overcome connection issues, identify safe routes, and enable clear communication about where residents can go in low speed vehicles. The Western Riverside Council of Governments (WRCOG) 4-City NEV Transportation Plan (Plan) presents a multi-jurisdiction transportation planning approach to leverage existing and future public street networks for maximum transportation benefit. This Plan identifies low speed connectors and potential NEV/bike lane backbone facilities within and between the cities of Corona, Norco, Riverside and Moreno Valley. The Plan also benefits unincorporated communities within the study area.

The Plan provides the necessary tools for local jurisdiction Plan adoption and may be used as a template for other communities contemplating similar transportation network enhancements. NEVs have the following key benefits:

- Enabling broad use of zero emission vehicles aids in attainment of greenhouse gas (GHG) emission reductions outlined in Senate Bill 375 (SB 375) and Assembly Bill 32 (AB 32);
- Reduce reliance upon fossil fuels;
- Improve utilization of existing Class I and Class II bicycle lanes through shared use where appropriate;
- Provide safe and efficient transportation alternatives for short trips; and
- Offer sustainable/livable community planning tool.

The Plan has been prepared through a grant from Southern California Association of Governments (SCAG). The role of WRCOG in the preparation of the Plan is to identify transportation benefits and potential NEV routes for consideration and to develop a useful sub-regional planning tool. Adoption of the plan by participating jurisdictions is not required. However, the Plan has been prepared to accommodate adoption by one or more jurisdictions and enable NEV usage as outlined in the Plan. Furthermore, each jurisdiction may elect to use the Plan as a basis for development and adoption of a locally prepared Plan.

The Plan includes Near Term and Long Range (Future) routes as shown on Exhibit ES-1. Near Term routes are assumed as an initial implementation phase in the one to three year time frame. Near Term routes rely on existing or planned Class II bike lanes suitable for shared use with NEVs. These routes can be converted for NEV use with little or no capital cost. Not all Class II bike lanes are appropriate for shared use with safety as a primary determining factor. Long Range (Future) routes include select existing and planned Class II bike lanes to complete the backbone NEV network. Long range routes can be implemented over time and concurrent with future road improvements. The Backbone network map also includes low speed connector roads. These low speed connectors also provide easy transition to potential NEV / bike lanes leading to more places and increased mobility.

Plan Management Structure

The project consultant team and WRCOG Project Manager utilized an Oversight Committee and a Working Group to assist with development of the Plan. The Oversight Committee functioned as a steering committee in the early stages of Plan development and was comprised of technical representatives from each of the four participating cities. The Working Group represented stakeholders within each jurisdiction, including Oversight Committee members, and was comprised of Planning Commissioners, a public safety representative, and staff

from Caltrans, Riverside County Transportation Commission (RCTC), Riverside Transit Agency (RTA), March Joint Powers Authority (JPA), and the County of Riverside Transportation department. Working Group membership was based upon recommendations from the Oversight Committee. Two Oversight Committee meetings and two Working Group meetings were held during the Plan development process.

Plan Elements

The Plan relies upon several components to provide a carefully considered, well crafted foundation for NEV operations. With their emphasis on short trips and top speed capabilities limited to 25 miles per hour (mph), NEVs are generally restricted to streets with posted speed limits of 35 mph or less. These vehicles are quiet and light weight compared to most cars and this raises legitimate safety questions. NEV operational concerns need to be addressed in the unique context of each community.

Population and Land Use (housing, employment, activity centers)

NEVs are suited for trips of less than 10 miles with a “sweet spot” of 1-5 miles. An examination of existing and project land uses was necessary to ensure that routes were identified to connect potential origin and destination points. Proposed routes connect residential areas, schools, parks, job centers, retail and other activity centers to the greatest degree possible.

Street / Travel Characteristics (speed limit, volumes, classifications, modal usage, potential for safety conflict)

NEVs will typically operate in auto travel lanes with conventional vehicle traffic on streets with posted speed limits of 35 mph or less. Streets with posted limits of 40 mph or greater require separate lanes for NEV operation. A review of posted speed limits with each city in the study area was required to identify areas where NEV routes were needed to interconnect low speed routes.

Public Input (survey, open houses, media)

NEVs are more likely to be used if safe and practical routes are provided where people want to go. The Plan relies upon stakeholder input, an online survey and a series of public open houses to identify important Plan features, address concerns and shape future actions.

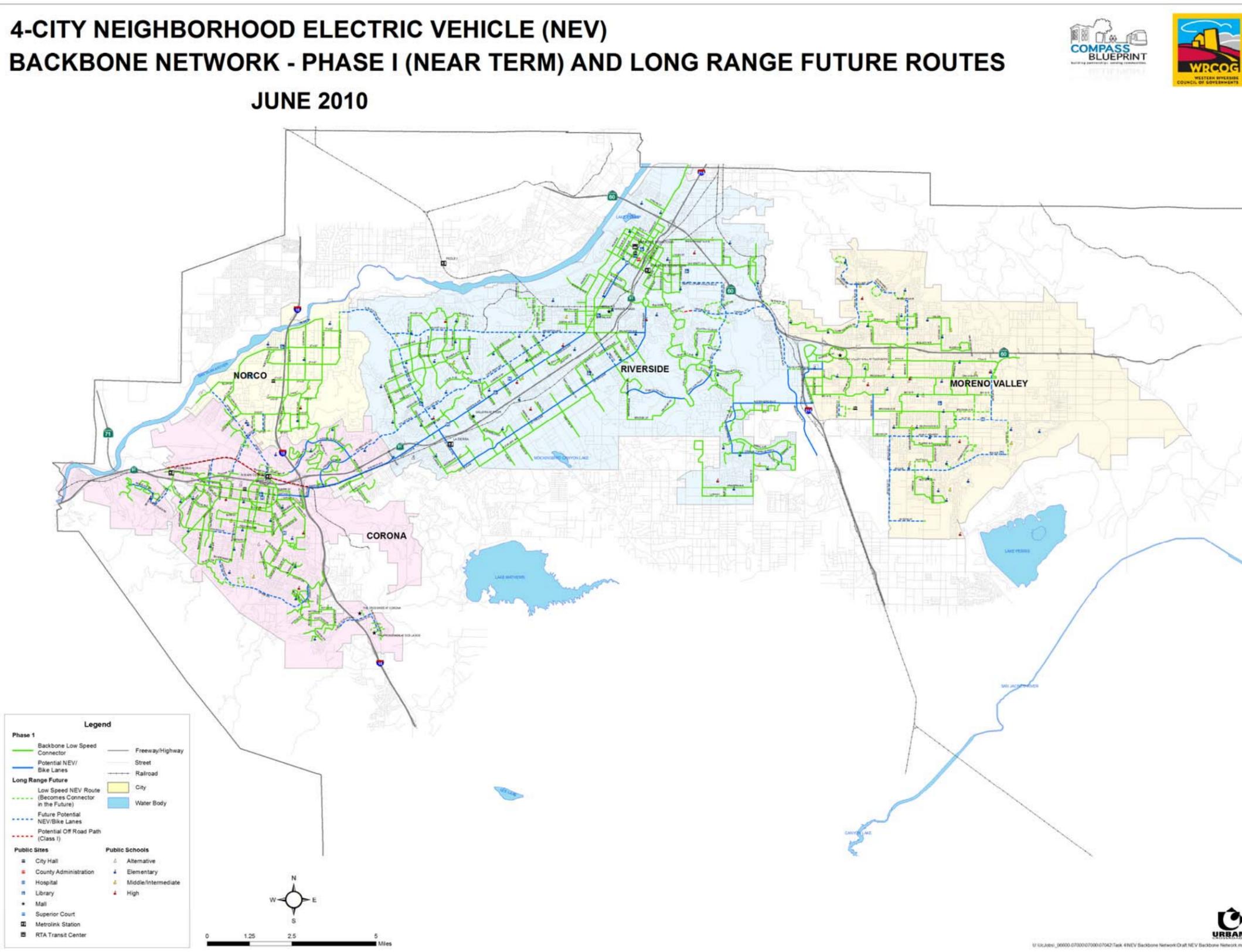
Potential for Implementation (cost, environmental, socio-political)

A plan is only good if it can be implemented. The WRCOG 4-City NEV Transportation Plan includes low impact Near Term routes designed to enable immediate adoption and use of NEVs with the study area. Long Term routes provide additional expansion options for the future.

Primary Findings

- Neighborhood Electric Vehicles provide a flexible alternative to traditional travel mode options;
- Study area can easily integrate NEVs onto existing transportation network with little or no capital cost (Near Term routes);
- Public Awareness Campaigns will be needed to increase awareness of NEVs and assure safety for all vehicle operators;
- A basic Long Term Backbone Network is achievable over time;
- Additional NEV routes can be included in future Plans to supplement the initial Backbone Network; and
- The process used to develop this Plan can be easily replicated in other communities.

Exhibit ES-1: Backbone Network



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Chapter 1 NEVs Demystified

What is an NEV?

Neighborhood Electric Vehicles (NEVs) are small, electric-powered, personal vehicles suitable 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. The NEV is 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 limits of 35 mph or less. Operations on roadways with posted speed limits greater than 35 mph are permitted within specially marked lanes as identified in a qualified NEV Transportation Plan and pursuant to enabling state law.

The benefits from expanding NEV use include, but are not limited to: energy savings (no gasoline consumption), improved air quality, operating cost savings, alternative mobility option, reduced congestion on freeways, community cohesion, and support of local businesses.

NEVs are 100% battery-electric powered vehicles. Factors that can affect the driving range include: 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 vehicle (pictured right) used under proper conditions with fully charged batteries, can travel approximately 30 miles on a charge.



Photo courtesy of Global Electric Motorcars: www.gemcars.com

Why an NEV?

An NEV can be a valued local transportation component of most communities. NEVs provide an easy to maneuver, environment friendly, compact vehicle ideal for short trips on an existing roadway network. The NEV can be a fun alternative mode of transportation to reach nearby commercial and activity centers in the local area, and to visit neighbors. Some of the benefits of utilizing NEVs are listed below.

- NEVs are relatively inexpensive to own and operate.
- NEVs are particularly well suited to trip lengths of less than 10 miles.
- NEVs provide mobility for people who cannot drive an automobile, including some disabled drivers¹.
- NEVs have a great safety record; they have been used in California since 1991 with no reported fatalities.
- NEVs have an assortment of safety features including seatbelts, headlights, and bumpers.
- The emergence of NEV friendly communities allows home builders and community planners to customize new developments to accommodate NEVs. NEV Transportation Planning is consistent with the Smart Growth multimodal approach to transportation planning and minimizing land use.
- NEV usage provides for a more cohesive community due to their limited travel range, and encourages residents to support their local businesses.
- NEV lanes double as bicycle routes with proper design, thus expanding the network of bike trails.
- NEVs are zero-emission vehicles. Unlike typical high-speed vehicles, NEVs do not contribute to the air pollution caused by cold-starts.
- NEVs achieve an "energy equivalent" of at least 150 mpg (based upon 2002 California Energy Commission report).

¹ A valid drivers license is required.

- NEVs have the potential to run fossil fuel free by using solar or wind power to generate electricity.
- NEVs are ideal as a second vehicle, or for teenage drivers who need local inexpensive transportation to and from school and related activities, and may lessen the chances of teenage driving fatalities.

It is not difficult to envision a future which includes an expanded array of mobility options for residents to travel within their community. In some cities, the NEV can play a central role in reaching the community's transit nodes and to conveniently access other mobility extensions such as train stations and airports.

Ideal Applications

General Public

For many communities the automobile remains the dominant mode of travel, even though many car trips are less than one mile. NEVs provide a clean transportation option, particularly for short trips on low-speed and low-volume roads. NEVs can also provide an important mobility option for people who do not prefer, or are not able to walk, ride a bike, or drive a conventional automobile.

NEVs are ideally suited for local errands, such as trips to the store, to and from school, and to local financial and medical centers. The most common use for NEVs is for recreation such as golfing, club activities, visiting, dining, and trips to fitness centers.



Student Pickup - Elementary School - City of Lincoln, CA

Business, Government and Institutional



Photo courtesy of Columbia ParCar: www.parcars.com

Military bases, garrisons, and installations can use battery-electric vehicles for a variety of base transportation needs. NEVs are a type of Fleet Operations Vehicle that can help achieve the 20% fuel reduction directive required by Executive Order 13149 because they are electric and require no fuel.

Large industrial campuses such as city water and wastewater treatment facilities, cover many acres. The use of an NEV, which produces no tailpipe emissions, is ideal for transporting around sensitive areas, ponds, and even indoor warehouses.

University and large school campuses can use NEVs to address a variety of transport needs, such as security and on-campus goods transport, and as a general people mover.

Chapter 2 Setting

Transportation Environment

Within the Plan study area, auto travel is the dominant transportation mode. A robust roadway and freeway network is used to address travel related to work and personal trips throughout the region. The state highway system also accommodates substantial pass through traffic for goods movement and travel to neighboring counties. Commuter rail and fixed route bus travel is successful with expansion plans underway subject to funding availability.

Each jurisdiction in the study area has adopted bicycle and trail plans. The existing bike route network has been implemented over time and was carefully considered for shared use opportunities during development of this Plan.

Corona

Streets: Primarily constructed with few missing segments.

Transit: Two Metrolink stations, fixed route and express bus service through RTA and Corona Shuttle.

Bike/Trail: Extensive network of Class I and Class II existing and future bike routes.

Norco

Streets: Most of the system is comprised of existing low speed, residential/rural streets.

Transit: Fixed route bus service provided by RTA.

Bike/Trail: Extensive trail system designed for horses and comprised of unimproved shoulders and class I routes to enable safe horse travel.

Riverside

Streets: Primarily constructed with few missing segments.

Transit: Two existing Metrolink stations with future stations planned, fixed route and express bus service through RTA, City-run demand response service.

Bike/Trail: Extensive network of Class I and Class II existing and future bike routes.

Moreno Valley

Streets: Primarily constructed with few missing segments with future work planned in eastern part of city.

Transit: Fixed route bus service provided by RTA.

Bike/Trail: Extensive network of Class I and Class II existing and future bike routes.

Unincorporated Communities (March JPA, Home Gardens, Coronita, and El Cerrito)

Streets: Unincorporated islands have a combination of existing and future roads.

Transit: Fixed route bus service provided by RTA and Corona Shuttle. March JPA is exploring opportunities for future transit center/Metrolink station.

Bike/Trail: Bike/trail network in study area is focused upon regional travel and connections to major routes within incorporated boundaries.

Opportunities and Constraints

The purpose of the WRCOG 4-City NEV Transportation Plan is to create near term and long range transportation network plans, and scalable implementation strategies for deployment of NEVs in the cities of Corona, Norco, Riverside, and Moreno Valley. An Opportunities and Constraints Memorandum (O&C Memo) was drafted in February 2010 and is included as **Appendix A**. GIS datasets were compiled to begin the mapping and planning process. Utilizing these datasets, the O&C Memo served as a brief inventory and analysis of existing local and regional destinations - including population density, employment density, and places of interest; circulation – posted speed limits, bicycle, and transit plans; existing Plans; and summaries of opportunities and constraints in the Cities of Corona, Norco Riverside, and Moreno Valley (4-Cities). The O&C Memo, and all data gathered was used during discussions of goals and objectives at Oversight Committee and Working Group meetings.

The O&C Memo also included a section with a summary of other similar Alternative Transportation and NEV Transportation Plans around the country, such as the Cities of Lincoln, Rocklin, Palm Desert, and Rancho Mission Viejo in California, and the City of Peachtree City in Georgia.

Opportunities are conditions that support or enhance the development of NEV transportation within a city. These include, but are not limited to, roadway networks with posted speed limit of 35 mph and under; available right of way width to retrofit lanes or add Class II NEV/bike lanes especially on those streets with posted speed limits above 35 mph; proximity to activity centers such as shopping, medical facilities, schools, colleges, parks, and golf courses. A suggested list of site opportunities to build upon for the 4-Cities was provided in the O&C Memo.

Constraints are conditions that may hinder the functionality of an NEV route. These include, but are not limited to, higher speed roads (above 35 mph), rail and freeway crossings, insufficient right of way to retrofit streets with posted speed limits over 35 mph, and high volume/high speed roadways that make NEV travel unsafe. A suggested list of constraints that could be overcome or minimized was provided in the O&C Memo.

During the preliminary planning stages, the team identified specific constraints and opportunities that were relevant to each community. The following characteristics were used as general guidelines to identify constraints and opportunities along roads and highways:

Constraints:

- Major intersections
- Roads with speed limits over 35 mph
- Heavily traveled roads that are at or below 35 mph
- Narrow bridges
- Roads with steep inclines
- Services not available within a 15 mile radius, due to the vehicle's range

Opportunities:

- Roads with speeds posted at or less than 35 mph
- Services within a 15 mile radius
- Identification of feasible paths and routes to provide multiple connections to key destinations
- Potential for integration of NEV operations and facilities with established bicycle facilities
- Placement of signage and lane markings for use in the NEV route plan
- Connections with existing public transportation options

Legislative Guidance

Over the last decade there has been a growing concern regarding the effect greenhouse gases (GHG) have had on our climate and how these gasses, particularly CO₂ may affect our future climate. As a result of these concerns, several actions have taken place including Executive Orders, Senate bills and Assembly bills, all of which include efforts to reduce GHG emissions through land use policies leading to fewer trips and reduced trip lengths, increased reliance on transit and promoting alternative modes of transportation. While none of the legislation specifically requires local jurisdictions to adopt policies, the legislation does require that regional GHG reduction targets be established and that local planning policies address the regionally established targets. An NEV Transportation Plan will assist local jurisdictions in meeting these goals.

It should also be noted that it is expected that federal transportation re-authorization legislation will include language modeled on California GHG legislation which may affect the ability of local jurisdictions to be eligible for future federal funding.

At the local level, a comprehensive, coordinated effort will result in more opportunity for funding, lessen overall costs and will provide a better program that meets the collective goals of the four participating cities in this Plan.

Planning and Policy Considerations

The Plan must consider a variety of planning and policy implications and solutions. It is the legislature's intent that development of the plan will explore and address transportation issues relevant to the community. Within the context of this Plan, the following topics were considered as they relate to the participating jurisdictions:

- Multi-model integration;
- Senior mobility;
- Economic development;
- Community involvement;
- Data collection and surveys;
- Long-range planning;
- Route selection;
- Signing and striping;
- Charging stations;
- Parking; and
- Circulation map.

Intra- and Inter-Jurisdictional Coordination

Establishing an intra- and inter-jurisdictional coordinated network is desirable to facilitate NEV use. The jurisdictions are working together to:

1. Coordinate / develop an initial plan.
2. Form a Technical Advisory Committee to make recommendations to respective councils.
3. Coordinate with local stakeholders and involve the public to:
 - Determine routes that provide the best connectivity between jurisdictions;
 - Determine if there are roads which are desirable to include in an NEV route that have overlapping or shared areas of authority.
 - Provide consistency in signing and striping between jurisdictions; and
 - Provide consistency in community design standards regarding location and design of charging stations

Long Range Planning

Issues related to air quality, GHG, transit, traffic congestion, and community design are 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 (AB 1358) that will fit into the Regional Transportation Plans (RTP) and the Metropolitan Transportation Plan (MTP). At the Federal level, Complete Streets design and Sustainable Communities Strategies language is being considered for addition to federal transportation guidelines to address GHG 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 that meets these goals and provides for mobility should be reviewed and strengthened to promote the use of non-auto modes, including NEVs.

AB 32

Governor Schwarzenegger set an aggressive goal of reducing climate change emissions within the State of California by signing Executive Order (EO) S-3-05, and the Climate Action Team (CAT) was formed. The State Legislature then passed Assembly Bill 32: California Global Warming Act of 2006; a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of GHG. EO S-17-06 was then signed by the Governor directing state agencies to begin implementing AB 32 and recommendations from the CAT. Since then, many local and state agencies have adopted their own Climate Action Plans which outline strategies to meet the California Climate Change Emissions Reduction Targets. Programs designed to inform the public, and in particular, local and regional jurisdictions, of the benefits of incorporating alternative modes of transportation, and particularly NEVs into their transportation plans, will help to accomplish the goals set forth in AB 32.

NEV Transportation Plans provide a fun, alternative mode of transportation that takes people out of an automobile, and helps to reduce GHG emissions.

SB 375

Senate Bill 375 was passed in September 2008. It includes requirements for: transportation planning; travel demand models; Sustainable Communities Strategy (SCS); and environmental review. SB 375 states “Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32.” Under SB 375, planning agencies are required to, among other things, “...prepare an alternative planning strategy to the SCS showing how the targets would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. The bill would require the State Air Resources Board to review each metropolitan planning organization’s SCS and alternative planning strategy to determine whether the strategy, if implemented, would achieve the greenhouse gas emission reduction targets.”

Although trip reduction targets are not positively impacted by NEV use, they replace the automobile; therefore incorporating NEVs into community development planning will help meet goals of SCS, and reduce environmental impacts.

AB 1358

Assembly Bill 1358 was passed in September 2008. It includes requirements for: planning, circulation element, and transportation. “This bill would require, commencing January 1, 2011, that the legislative body of a city or county, upon any substantive revision of the circulation element of the general plan, modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways, defined to include motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation, in a manner that is suitable to the rural, suburban, or urban context of the general plan.”

Encouraging NEV use through implementation of safe NEV routes provides a mobility choice to include in a City’s circulation element that will help meet the goals of AB 1358 and develop a balanced, multimodal transportation network.

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Chapter 3 Process

Project Oversight

Preparation of the WRCOG 4-City NEV Transportation Plan was a cooperative effort between the consultant team, project sponsors, potential implementing agencies and interested stakeholders. With guidance from WRCOG, an Oversight Committee and stakeholder’s Working Group were used to review and provide input regarding data collection, design consideration and route selection.

The Oversight Committee acted as a steering committee and was comprised of representatives from WRCOG, SCAG and each of the four cities. Membership included the following:

WRCOG: Danielle Coats (Project Manager)
 SCAG: Peter Brandenburg (Contract Administrator)
 Corona: Bob Morin and Rafael Martinez
 Norco: Steve King
 Riverside: Steve Libring and Diane Jenkins
 Moreno Valley: Jon Terell and Eric Lewis

The Working Group was comprised of Oversight Committee members and select stakeholders from each jurisdiction as well as other relevant entities. Participants included:

County: Lawrence Tai and Dennis Acuna
 Riverside: Sgt. Dwayne May and Brandi Becker
 Moreno Valley: Planning Commissioners Rick DeJong, Richard Dozier and George Salas
 March JPA: Dan Fairbanks and Brett Dawson
 Caltrans: Milele Robertson
 RCTC: Tanya Love and Henry Nickel
 RTA: Scott Richardson



Route development with Working Group

Reference Materials Review

The consultant team, project manager and project participants provide a wealth of experience in transportation and policy related issues. External reference materials, case studies and GIS datasets enhance the collective understanding study participants regarding neighborhood electric vehicles and the role they can play within the study area. An assortment of regulatory actions, articles, and technical information were evaluated and considered during the Plan development process. More than 70 documents and 20 GIS datasets were referenced for background information or direct use within the Plan. A list of these documents and datasets is included in Appendix B.

Public Input

NEVs are relatively new in Riverside County. Although the City of Riverside uses these vehicles extensively in the downtown area for community outreach and parking management, low speed vehicle operations are larger restricted to golf carts in certain communities. The public input process was largely devoted to education and outreach. Local print, television, and radio coverage provided broad exposure. Additionally, an online survey, three public open houses and participation in a panel discussion/presentation at WRCOG’s 11th Annual Advancing the Choice alternative fuel vehicle expo provided additional opportunities to share information and gather feedback.

Online Survey

An online survey was developed to gather basic information related to respondents' trip characteristics, NEV knowledge, and preferred Plan features. The survey was also distributed at the open house events and is attached as Appendix C. The results were useful in helping to shape the final Plan.

- NEVs and golf carts have been seen in public use by half of respondents;
- Majority of respondents use traditional vehicles (excluding transit) for travel;
- 44% of all trips identified were less than 4 miles in length while nearly 60% were 7 miles or less; 65% of shopping trips were 4 miles or less;
- More than half of trips to school were 2 miles or less;
- Cost of vehicles and [long] trip distance were ranked high as concerns for potential NEV users to adopt;
- Cost of Electricity does not appear to be a significant limiting factor;
- Concern for safety and lack of available driving lanes should be addressed in Plan implementation to ensure success;
- Short trip length and low environmental impacts are most appealing NEV characteristics identified in the survey;
- Anticipated low operating cost identified by less than half of respondents as most appealing (suggests usage cost are not a primary concern); and
- Linkage preferences are highest for shopping centers, parks and schools followed by employment centers while transit access (Metrolink, bus depots and park & ride lots) rated relatively low – suggests non-work trips are viewed as most likely NEV trip types.

Public Open Houses

Open House events were held in Corona, Moreno Valley and Riverside. Each event included representatives from the host city as well as information boards that provided background, context and draft route maps. Hard copy versions of the online survey were distributed to attendees for additional input. Large reprints of the draft Backbone route map were used as a basis for one-on-one discussion and identification or potential revisions. Input received at the open houses proved useful. In particular, route and phasing suggestions gathered during the Riverside Open House directly resulted in revisions to the proposed network.



Receiving input during an open house

Route Selection Methodology

With their emphasis on short trips and speed capabilities limited to 25 mph, NEVs are generally restricted to streets with posted speed limits of 35 mph or less. These vehicles are quiet and lightweight compared to most cars and this raises legitimate safety questions. Operations on higher speed streets require special accommodations which adhere to strict design guidelines. A survey of speed limits within each jurisdiction was necessary to assess potential for successful and effective NEV routes. An inventory of key activity centers (employment, shopping, entertainment, recreation, etc.) was prepared to help identify key connection opportunities. Design guidelines and limitations must be considered as a critical component of the route selection process.

Design Guidelines

These guidelines are not exhaustive, and depending on the particular characteristics of a roadway, additional site-specific information and professional expertise may be considered. At a minimum, NEV routes on roadways with a posted speed greater than 35 mph are proposed on separate NEV/Bike lanes.

The following are suggested guidelines:

- NEV may operate on 2-lane roadways classified as minor arterial, minor and major collectors, and local roads. Use of NEV upon major arterial roadways is discouraged.
- NEVs are not recommended to operate on roadways with an average daily traffic volume greater than 24,000 vehicles.
- NEVs on roadways with medium or high levels of heavy vehicle (commercial, industrial, etc.) use may not be appropriate. Roadways with low volumes of heavy vehicle use (less than 5%) may be more desirable.
- NEVs operating on roadways with sustained grades of more than 5 percent and over 800 feet in length makes it difficult for NEVs to climb at normal speeds.
- NEVs are not recommended to operate in areas where the collision rate and collision frequency is greater than the critical collision rate.
- With the approval of the Department of Transportation (Caltrans), NEVs may be able to operate on state highways that pass through cities and towns (i.e. main streets) posted 35 mph or less.
- NEV turning movements at major intersections: Left turn movements, much like bicyclists are allowed to make, can be achieved (when safe to do so) by making the NEV user merge into the same left lane used by other motor vehicles.
- Universal signage: Recommend use of CTCDC Experimental Approved Signage (from Cities of Lincoln and Rocklin, California). Due to growing interest from several California communities, Caltrans is considering implementing statewide standards.
- For Roadways posted above 35mph, recommend 7' minimum shared Bike/NEV lanes.
Shared Lane Interaction: The speed differentials of bicycling (15 mph) and NEVs (25 mph maximum) are within a close range, therefore conflicts are minimal. For example, in the City of Lincoln, bikes and NEVs (over 800 NEVs) have shared facilities since 2006 with no reported incidents. Also note, Bike/NEV interaction is minimized by the underutilization of these facilities by both users.
- During NEV implementation stages, potential impacts to visually impaired community should be considered.

Roadway Classifications

The following guidelines provide general design recommendations for NEV and multimodal facilities at various service levels. These guidelines are not intended to be a substitute for site-specific design and engineering that would consider, among other details, local conditions, development requirements, and safety considerations. These guidelines are to be used in conjunction with local improvement standards and procedures.

Class I, II, and III Facilities

Multimodal facilities have various design specifications to consider. Classifications for NEV facilities were developed in a similar fashion to bicycle route facilities. Class I NEV routes provide a completely separate right-of-way for the exclusive use of NEVs, pedestrians and bicycles with cross-flow minimized. Class II NEV routes are designated as a separate striped lane adjacent to traffic. Class III NEV routes provide for shared use with automobile traffic on streets with a posted speed limit of 35 mph or less. Residential streets are generally Class III NEV routes. See **Exhibit 3-1** for cross section examples and summary of descriptions.

When choosing the facility classification, the design objectives should always be kept in mind to develop the best possible connections between residential neighborhoods, civic center destinations, parks, educational facilities, shopping and recreational facilities.

Class I Facilities

Class I NEV routes provide a completely separate right-of-way for the exclusive use of NEVs. Shared use with pedestrians and bicycles is typical due to limited right of way availability. Off-street Class I NEV paths may consider such areas as open space corridors, utility easements including adjacent to railroads or other areas. This will minimize cross traffic conflicts with automobiles. Ideally, A Class I two-way path should consist of a 14-foot wide path, plus 2 foot shoulders, for an approximate 18 foot wide corridor. Several design options are presented in **Exhibit 3-2**.

Elements to consider when designing a Class I paved trail include, but are not limited to: safety, vegetation clearance, sign placement, trail shapes, sight distance, gradients, ramps, surfacing, grade crossings, and other geometric considerations.



**NEV on Class I separate pathway
Lincoln, California**

Class II Facilities

Class II NEV routes are designated as a separate, single-striped lane adjacent to traffic on streets with posted speed limits in excess of 35 mph. NEVs, bicycle, and pedestrian facilities will interface on local, residential and collector streets and therefore must be designated with appropriate signage alerting residents to the shared use function of the street and separated NEV/bike lanes.

Within the City of Lincoln, CA a width of 7-feet on Class II NEV facilities was appropriate on collector streets that meet the following design criteria:

- Collector streets should be capable of providing a high level of service to insure that adequate capacity exists for automobiles, bicyclists and NEVs. The City of Lincoln requires that two lane collector streets operate at level of service (LOS) C but this requirement is somewhat arbitrary and can vary depending on jurisdiction and location and type of facility. In the City of Lincoln, for two-lane collector streets, a target volume threshold of 24,000 vehicles per day was used.



**NEV on Class II facility
Lincoln, California**

Class III Facilities

Class III NEV routes provide for shared use with automobile traffic on roads with a posted speed limit of up to 35 mph.

Shared NEV routes are normally designated on residential streets and low-volume neighborhood roads, resort communities, ferry terminals, airports, universities, and other low-speed areas. The maximum allowed speed limit is 35 mph. Although NEVs are legally permitted to operate on these streets, jurisdictions may elect to limit operations by statute where community or safety concerns dictate.



**NEV in Class III residential neighborhood.
Lincoln, California**

Exhibit 3-1: NEV Cross-Sections

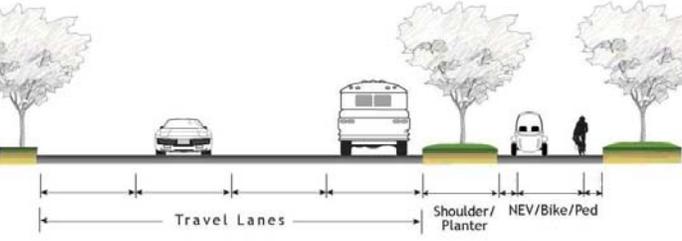
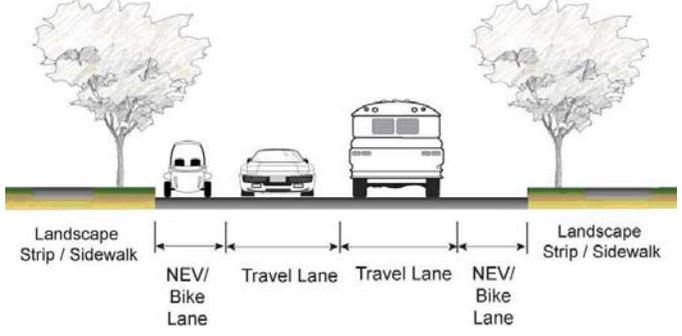
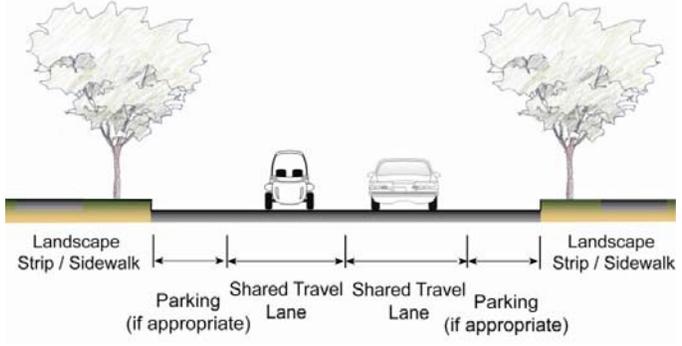
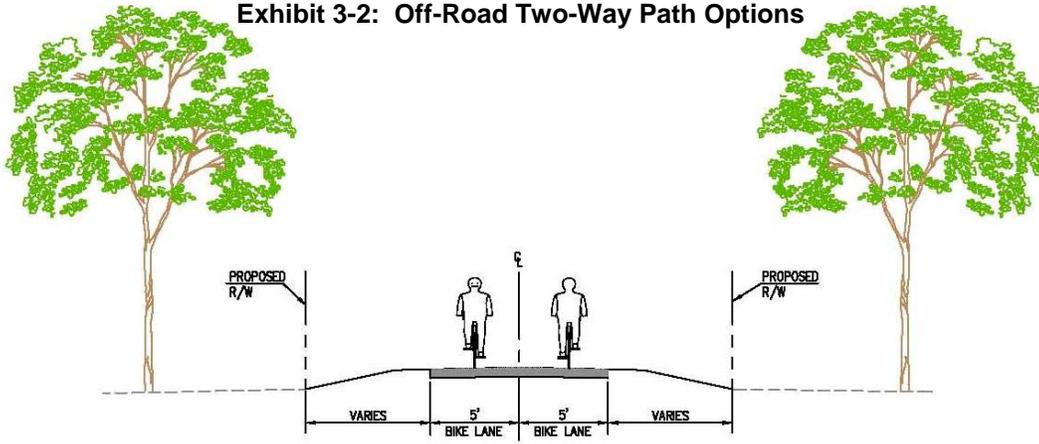
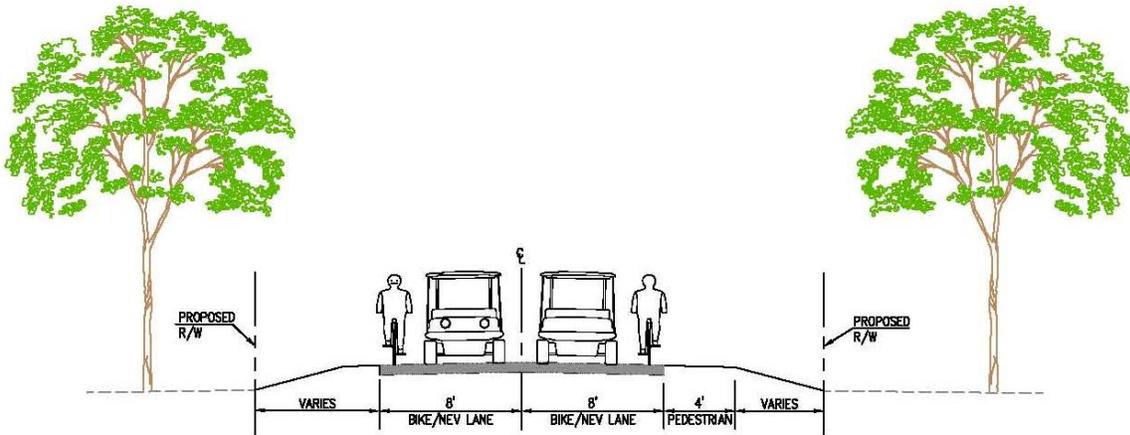
Classification	Description	Example Cross-Section
Class I	Completely separate pathway; adjacent to major roadways. NEVs can share a path with bicycles and pedestrians. See Exhibit 3-2 for path options.	 <p>The diagram shows a roadway with two travel lanes. To the right of the travel lanes is a shoulder/planter area. Further to the right is a separate pathway for NEVs, bicycles, and pedestrians, separated from the roadway by a planter area. Trees are shown on both sides of the roadway.</p>
Class II	Collector streets and minor arterials where speeds are typically greater than 35 mph. NEVs share lane with bicycles.	 <p>The diagram shows a roadway with two travel lanes. On either side of the travel lanes are NEV/Bike lanes. The roadway is flanked by landscape strips or sidewalks. Trees are shown on both sides of the roadway.</p>
Class III	Shared travel lane. Residential and low volume roads, low-speed commercial streets. Posted speed limits of up to 35 mph.	 <p>The diagram shows a roadway with two shared travel lanes. On either side of the travel lanes are parking areas (if appropriate). The roadway is flanked by landscape strips or sidewalks. Trees are shown on both sides of the roadway.</p>

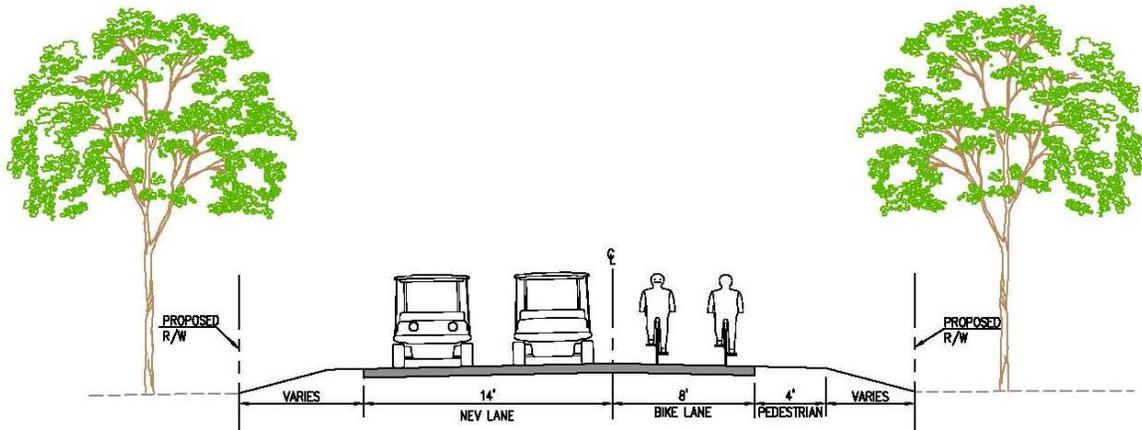
Exhibit 3-2: Off-Road Two-Way Path Options



OPTION A: OFF ROAD BIKE PATH



OPTION B: OFF ROAD SHARED BIKE/NEV PATH (CONSTRAINED R/W)



OPTION C: OFF ROAD BIKE/NEV PATH (UNCONSTRAINED R/W)

Modal Integration

The traffic mix on a given roadway may limit route choices during design. A multimodal facility would be best served by restricting NEVs from truck routes, for example. This restriction will help lessen the vehicle conflicts between smaller slower modes and large heavy vehicles.

Multimodal Facilities

NEV routes may in some circumstances be utilized as bicycle lanes, thereby increasing the miles of bicycle lanes throughout a city. A separated multimodal facility would increase safety for various types of users.

NEV Route signs can be placed on local streets, which have been designated as NEV Routes. Signs may be placed at the far side of collector street intersections at 1/2 mile intervals on all continuous residential streets.

Combination NEV/Bike Lane signs can be placed on NEV lanes where a Class II bicycle lane is also provided. The sign should be placed at the far side of a collector street.

Experience in the City of Lincoln indicated that a minimum 7-foot lane is recommended to accommodate an NEV or bicycle passing movements and to provide a reasonable sense of safety adjacent to auto travel lanes where speeds are typically greater than 35 mph. Caution should be taken to properly stripe the lanes to avoid making lanes too wide so as to attract autos into it. For example, if the 7-foot NEV lane was combined with the 4-foot bicycle lane the result would be an 11-foot travel lane for both NEVs and bicycles. However, this lane width may invite automobiles to use the lane, thus encroaching on NEV and bicycle travel.



Combination Lane/Route Sign
Example from Lincoln, CA

Multimodal Considerations

The Plan is designed to lessen potential conflicts between modes while maximizing the benefits from expanded choice in travel. The following items were considered as part of the development of the Plan:

- Location of transit stops and transfer stations;
- Potential parking at transit locations;
- NEV integration with bicycles on the same facility;
- NEV and bicycle parking at transfer locations; and
- Charging stations at multimodal transportation connection points.

System Upgrades

NEV Charging Stations

NEVs are easily charged, using a standard 20 amp 115 volt outlet. Locate charging stations in local and regional destinations including:

- Retail centers
- Commercial centers
- Medical facilities
- Educational facilities
- Neighborhood parks and recreation facilities

Existing light poles can be retrofitted and used as charging stations in most cases, however specially designed charging stations have been used successfully in other communities.

Parking lot designs can vary greatly, however recommendations for accommodating charging stations are as follows:

- For newly designed parking lots, stand-alone charging station pedestals as shown at right are recommended.
- Landscaping around charging stations should consider minimal or low growth plant varieties, so as to not obstruct access to the outlet.

NEV Parking

NEV parking encourages residents to support their local businesses.

NEV Parking and Charging Station Signage

Adopting Standard Signage has many benefits. Lincoln discovered that utilizing a uniform design type, for both parking and charging stations, would assist NEV users in locating them. It is also beneficial to locate parking and charging stations in close proximity to the store entrance.

Examples of possible parking and charging station Standards are included in **Appendix D**.



NEV Charging Station



NEV Parking Signage and Pavement Marking



At-Grade Crossings

The design of NEV facilities or guidelines for crossing intersections is accomplished in a manner that is consistent with the normal rules of the road. An NEV is allowed to cross a roadway with a speed limit in excess of 35 mph if the crossing begins and ends on roadways with a speed limit of 35 mph or less and occurs at an intersection of approximately 90 degrees. An NEV is not allowed to traverse an uncontrolled intersection with any State highway unless that intersection has been approved and authorized by the agency having primary traffic enforcement responsibilities for that crossing.

Pavement Markings

Combination NEV/Bike Lane Pavement Marking (pictured below) is designed to be placed on NEV lanes where a Class II bicycle lane is also provided. NEV pavement markings are designed to be placed on local streets, which have been designated as NEV Routes.



NEV/Bike Lane Pavement Marking and Striping
in Lincoln, CA

NEV Lane Striping used is a 6-inch white line designed to be placed between the traffic lane and the NEV/Bike lane.

NEVs require less physical space than traditional automobiles, so accommodations can be made to existing roadways without much cost, simply by restriping and adding signage where appropriate. The preparation of construction documents can be as simple as signing and striping plans, to more complex plans if the NEV facility requires the construction of bridges, retaining walls, or acquiring right-of-way.

Other Signage

“NEVs prohibited beyond this point” sign was used in the City of Lincoln, as appropriate, to designate roadway sections where NEV travel was prohibited.

For example, NEV travel was prohibited on roadways with posted speeds above 35mph that were not part of the NEV Transportation Plan and/or did not have separate NEV lanes.



Pictorial Signs

Within the U.S., Federal guidelines and procedures for the design and posting of pictorial signs must be followed. As NEVs are a relatively new form of transportation, there are no federally approved pictorial standards for NEVs.

NEV Development and Retrofit of Existing Areas

Opportunities to provide a multimodal circulation plan within established neighborhoods and communities will not require extensive construction efforts to retrofit existing facilities to accommodate NEV travel.

In most cases, designating safe routes for NEV travel can be accomplished by designating existing city streets with posted speeds up to 35 mph. Existing commercial centers can retrofit parking areas and provide charging stations at minimal costs. A few parking stalls can be restriped to accommodate NEV parking and charging stations installed as described in earlier sections of this document.

Maintenance

Jurisdictions will need to consider the maintenance costs of the NEV facilities in their operational budget. Facilities that are unmaintained can accumulate debris and provide an unsafe riding surface for the facility users. In addition, in time, the existing pavement will deteriorate and require repair. All NEV facilities will have common maintenance needs that may include, but not limited to:

- Regularly scheduled sweeping;
- Signs and pavement marking inspections performed on a regular basis;
- Drainage system inspections and debris removal; and
- Inspect landscaping and vegetation encroaching onto NEV travel areas.

Local Improvement Standards

Once an NEV Transportation Plan is adopted, consider including NEV signage, striping, pavement markings, parking, and charging recommendations into the local improvement standards and specification manuals. These standards will not only provide guidance for internal staff, but to commercial and retail developers who wish to incorporate this infrastructure into their projects.

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Chapter 4 Routes

This Plan proposes an effective network of NEV routes, however minor modifications to proposed routes are often made as the plan begins to be implemented. The Plan will continue to evolve once it is underway, so modifications to the Plan are anticipated and encouraged. Travel patterns are dynamic and affected by growth outside of the City, changing land use patterns, and changing travel behaviors.

Near Term and Long Range Considerations

An important feature of the Plan is identification of Near Term (Phase I) and Long Range Future Routes. Near Term facilities can be provided within the first 1-3 years of Plan adoption. These Phase I routes represent low speed connectors and shared NEV/bike lanes with little to no cost for capital improvements. Low speed connectors are streets that have posted speed limits of 35 mph or less that either provide direct connection to key destinations or link to NEV/bike lanes on higher speed routes. Shared NEV/bike lanes are proposed for higher speed routes in conjunction with existing Class II bike lanes. Restriping may be necessary where these bike lanes are less than 7 feet wide.

Long Range routes refer to time frame rather than distance. The routes are long term with implementation occurring over time. In most instances, future road widening or other operational improvements will be necessary. Local agency and regional bike plans were carefully considered to maximize opportunities to leverage future transportation investments effectively.

The resulting proposed Backbone Network provides a basic NEV system that can be modified or embellished upon as needed. Connections between jurisdictions are included where appropriate and recognize that travel is rarely restricted by city boundaries.

Route Descriptions

Each community is unique and their transportation needs should be considered within the appropriate context. Travel patterns within and between these communities is similarly affected by current and future land uses. The Plan takes a comprehensive look at NEV routes over a broad area and adopts a macro view. Individual jurisdictions will find the resulting routes useful but may elect to embellish upon the proposed network to address the needs and desires of specific neighborhoods. Opportunities and constraints were explored early in the route selection process and are included as **Appendix A** of this Plan. The following discussion highlights potential routes for consideration.

Corona

The City has extensive residential development, several commercial corridors, two Metrolink stations, major recreation facilities, and office/industrial land uses. Many streets in the City have posted speed limits of 35 mph or less and can legally host NEVs without further planning. However, there are a number of connections that cannot be made without the use of NEV lanes. The proposed Backbone Network for Corona is shown on **Exhibit 4-1**. Potential NEV lanes are on the exhibit as “Blue” lines and are described below. Low speed connectors are shown on the exhibit as “Green” and are depicted for context and to illustrate the level of coverage attainable through the Plan.

Near Term Phase I Routes

- Ridgeline Drive (Summit View to Via Corozon)
- California Avenue (Masters to Chase)
- Sixth Street (E. Grand to Radio)
- Radio Road (Sixth to Sampson)
- Sampson Avenue (Radio to Buchanan)
- Parkridge Avenue (Harrison to Hidden Valley)
- Hidden Valley Parkway (Parkridge to Promenade)
- Promenade Avenue (Sampson to Hidden Valley)

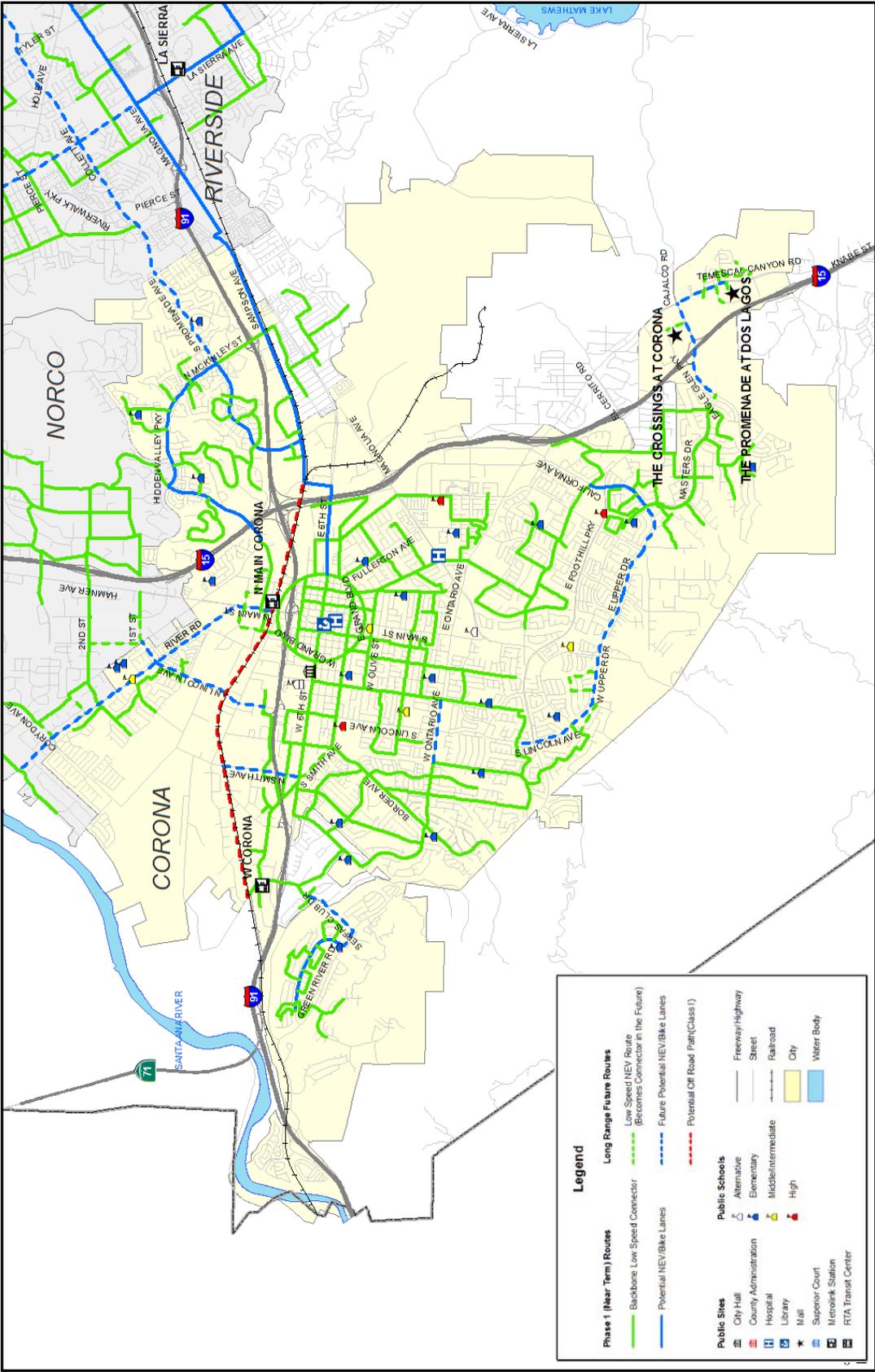
Long Range Future Routes

(all Class II except BNSF as Class I)

- Ridgeline Drive (Via Corozon to Green River)
- Green River Road (Ridgeline to Serfas Club)
- Serfas Club Drive (Green River to Monterey Peninsula)
- Ontario Avenue (Oak to Buena Vista)
- Lincoln Avenue (Silver Creek to Foothill)
- Lincoln Avenue (Pomona to Parkridge)
- Upper Drive (Foothill to Lemon)
- California Avenue (Lemon to Masters)
- Eagle Glen Parkway (Masters to Bedford Canyon)
- Cajalco Road (Bedford Canyon to Temescal Canyon)
- Temescal Canyon (Cajalco to Pronio)
- Smith Avenue (Sixth to BNSF)
- Main Street (Grand to Railroad)
- River Road (Corydon to Main)
- Promenade Avenue (Hidden Valley to Buchanan)
- BNSF Railroad (Auto Center to Radio/Samson)



Exhibit 4-1: Backbone Network for Corona and Surrounding Area



Norco

The City has extensive residential development, primarily in a rural setting, with one major commercial corridor. Many streets in the City have posted speed limits of 35 mph or less and can legally host NEVs without further planning. However, connections to neighboring cities are limited without the use of NEV lanes at key locations. The proposed Backbone Network for Norco is shown on Exhibit 4-2. Potential NEV lanes are on the exhibit as “Blue” lines and are described below. Low speed connectors are shown on the exhibit as “Green” and are depicted for context and to illustrate the level of coverage attainable through the Plan.

Near Term Phase I Routes

- All Near Term Routes are low speed connectors on streets with posted speed limits of 35 mph or less

Long Range Future Routes (all Class II)

- Arlington Avenue (California to east city limit)
- Mountain Avenue (First to Second)
- River Road (Bluff to Corydon)

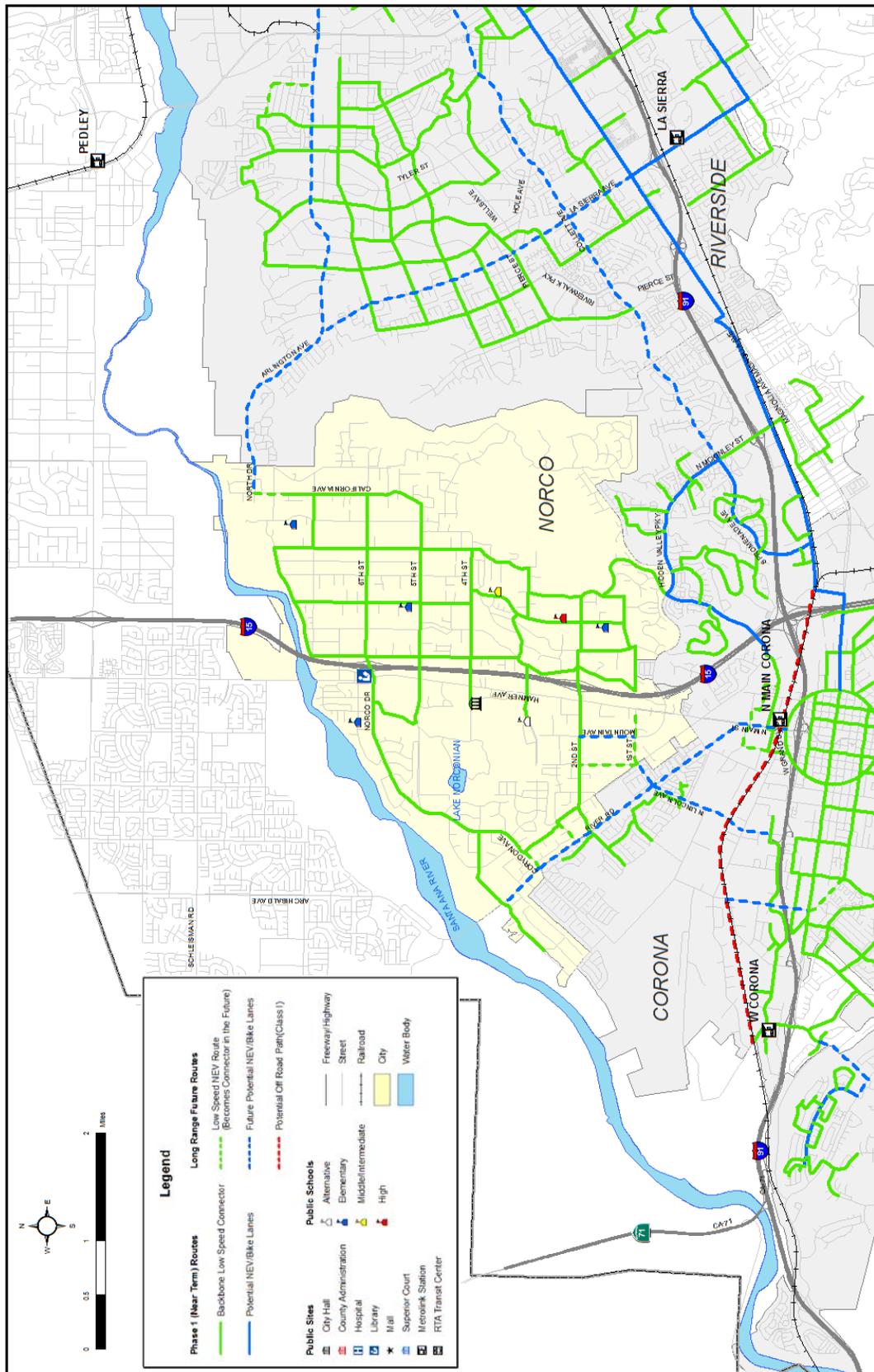
Unique Challenges and Opportunities

The City of Norco is an active equestrian community. Safe NEV operations in close proximity to horses will need to be explored prior to expansion of the proposed network within city limits. The Plan includes a number of low speed connectors where NEVs can legally operate today. Golf carts and all terrain vehicles are common in many of the areas. NEVs are quiet and capable of speeds in excess of common, unmodified golf carts. This differential in speed and the near stealth operations, from a sound perspective, should be an important feature of any public awareness campaign for potential users. NEVs are not inherently unsafe. Operators should be sensitive to the potential to “spook” horses and behave accordingly. Currently residents chose Norco for the lifestyle and are likely to be sensitive to the issue.

Hamner Avenue serves as the most visible “Main Street” for commercial activity with connections to neighboring jurisdictions. Future Plans should explore the possibility of a Class II NEV/bike lane on this backbone facility to extend the reach and enable more direct access to major retail, dining and recreational destinations within the city.



Exhibit 4-2: Backbone Network for Norco and Surrounding Area



Riverside

The City has a mature and extensive mix of residential, commercial and office/industrial land uses. There are two Metrolink stations, a downtown transit center, and a network of existing Class I and Class II bike lanes. Many streets in the City have posted speed limits of 35 mph or less and can legally host NEVs without further planning. However, connections to neighboring cities are limited without the use of NEV lanes at key locations. The proposed Backbone Network for Riverside is shown on Exhibit 4-3. Potential NEV lanes are on the exhibit as “Blue” lines and are described below. Low speed connectors are shown on the exhibit as “Green” and are depicted for context and to illustrate the level of coverage attainable through the Plan.

Near Term Phase I Routes (all Class II)

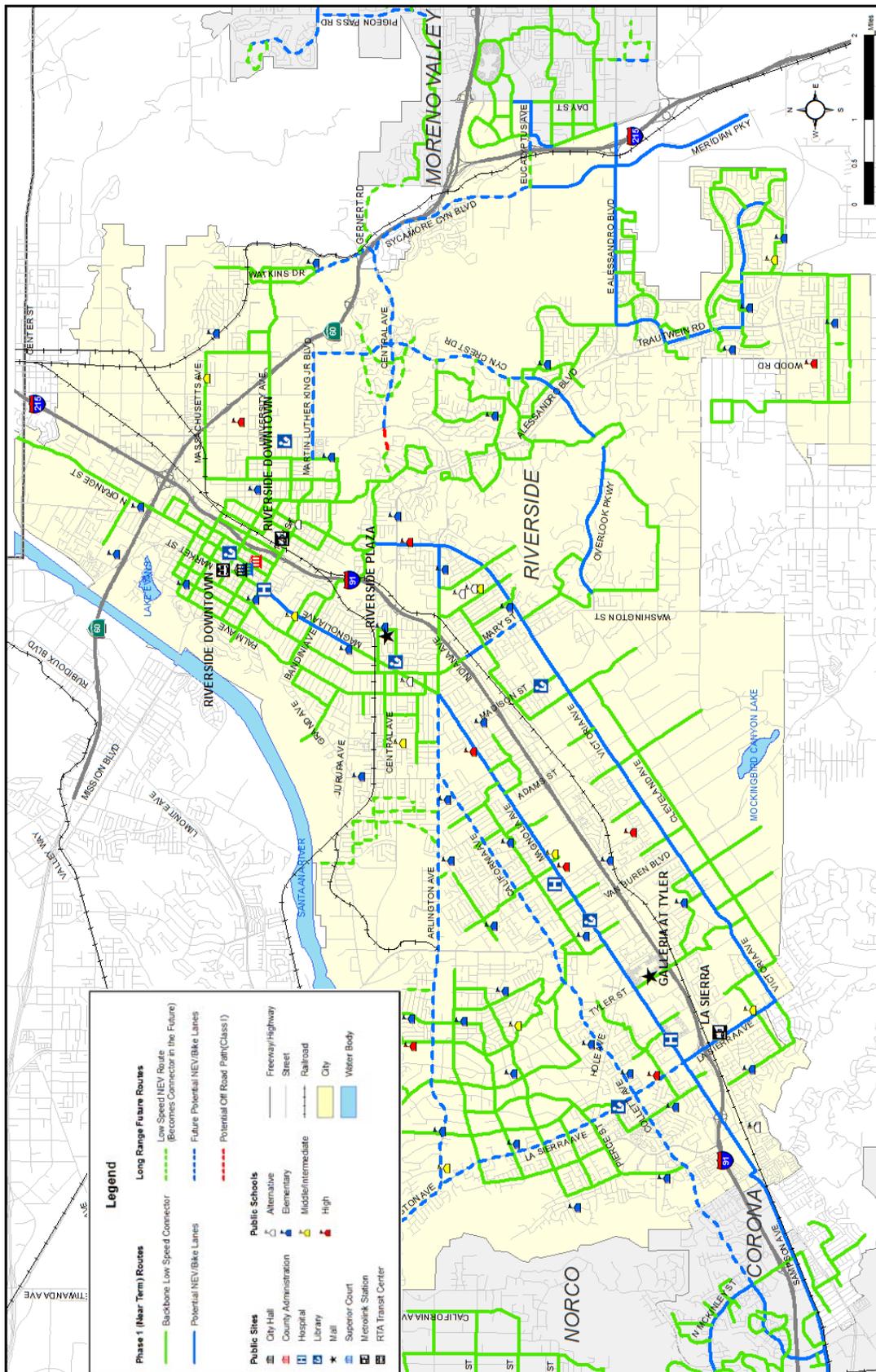
- Arlington Avenue (Horace to Victoria)
- Sampson Avenue (west city limit to Buchanan)
- Buchanan Avenue (Sampson to Magnolia)
- Magnolia Avenue (Buchanan to Arlington)
- Victoria Avenue (Las Sierra to Myrtle)
- La Sierra (Magnolia to Victoria)
- Mary Street (Indiana to Marguerita)
- Alessandro Boulevard (Mission Grove to Old I-215)
- Mission Grove Parkway (Alessandro to Trautwein)
- Trautwein Road (Mission Grove to Orange Terrace)
- Orange Terrace Parkway (Trautwein to Sandhill)
- Sycamore Canyon (Eucalyptus to Alessandro)
- Meridian Parkway (Alessandro to southern terminus):

Long Range Future Routes (all Class II except Central West as Class I)

- Arlington Avenue (west city limit to Magnolia)
- La Sierra Avenue (Arlington to Magnolia)
- Collett Avenue (west city limit to Hole)
- California Avenue (Hole to Arlington)
- Magnolia Avenue (Jurupa to 14th)
- Mary Street (Marguerita to Victoria)
- Martin Luther King (Ottawa to Canyon Crest)
- Overlook Parkway (Muirfield to Crystal View Terrace)
- Overlook Parkway (Via Vista to Alessandro)
- Canyon Crest Drive (Alessandro to Martin Luther King)
- Central Avenue “West” (Fairview to Chicago)
- Central Avenue (Chicago to Sycamore Canyon)
- Watkins Drive (Mount Vernon to Central)
- Sycamore Canyon (Central to Eucalyptus)



Exhibit 4-3: Backbone Network for Riverside and Surrounding Area



Moreno Valley

The City has an extensive mix of residential, commercial and office/industrial land uses. Future development opportunities are most prevalent in the eastern part of the City. There is a network of existing and planned Class I and Class II bike lanes. The street network is a typical grid with many roads having a posted speed limit greater than 35 mph. However, there are several key parallel roads at or below 35 mph that can serve as a basic NEV low speed connector network. The proposed Backbone Network for Moreno Valley is shown on Exhibit 4-4. Potential NEV lanes are on the exhibit as “Blue” lines and are described below. Low speed connectors are shown on the exhibit as “Green” and are depicted for context and to illustrate the level of coverage attainable through the Plan.

Near Term Phase I Routes (all Class II)

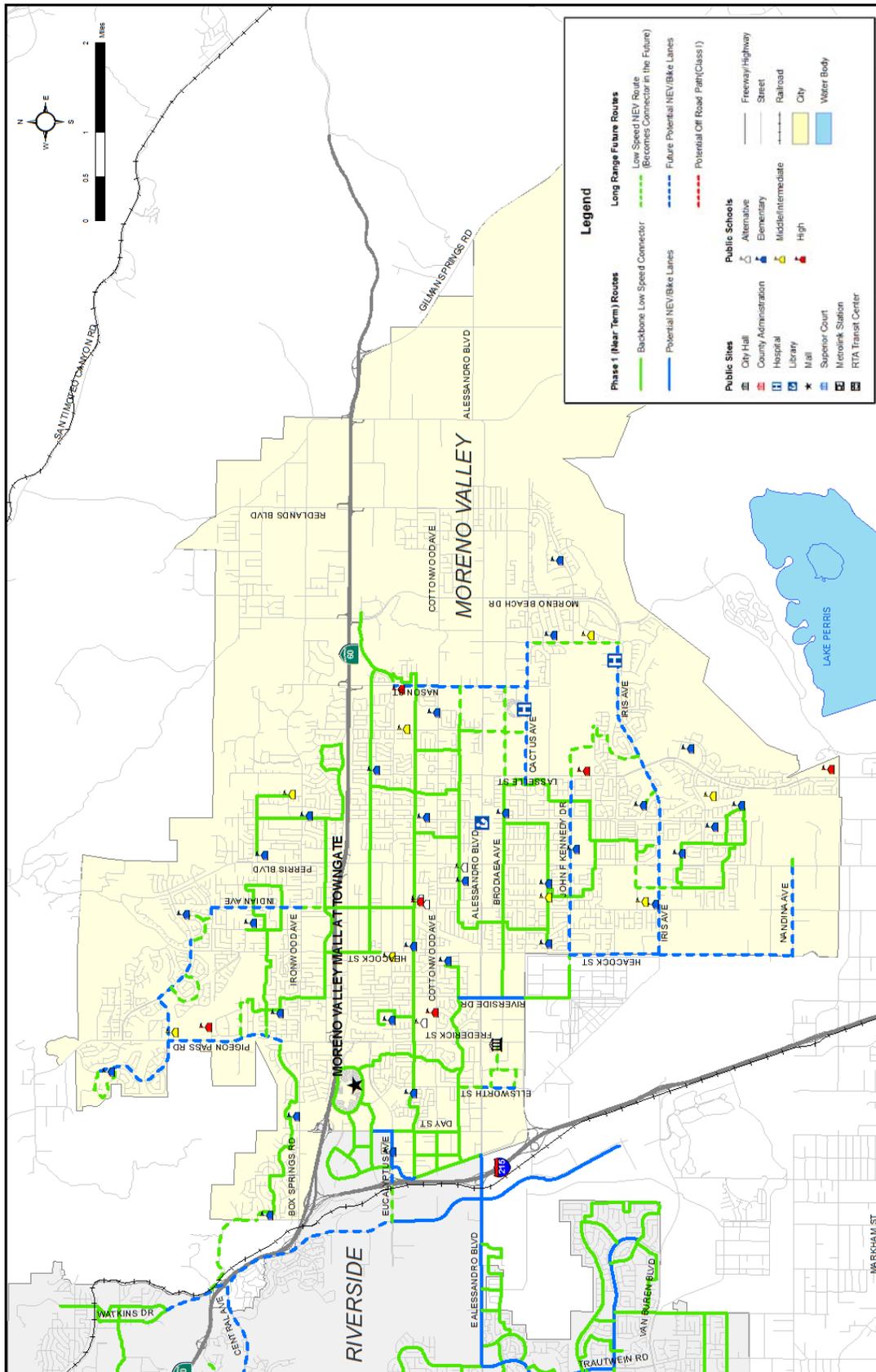
- Eucalyptus Avenue (Valley Springs to Day)
- Day Street (Gateway to Eucalyptus)
- Old 215 Frontage Road (Eucalyptus to Dracaea)
- Riverside Drive (Bay to Cactus)

Long Range Future Routes (all Class II)

- Hidden Springs Drive (Greenridge to Pigeon Pass)
- Old Lake Drive (Pigeon Pass to Sunnymead Ranch)
- Sunnymead Ranch Parkway (Old Lake to Canyon Vista)
- Pigeon Pass Road (Hidden Springs to Climbing Rose)
- Manzanita Avenue (Duckbill to Indian)
- Indian Street (Manzanita to Ironwood)
- Eucalyptus Avenue (I-215 to Valley Springs)
- Ellsworth Street (Alessandro to Golden Crest)
- John F Kennedy Drive (Heacock to Lasselle)
- Cactus Avenue (Sylvester to Oliver)
- Iris Avenue (Heacock to Oliver)
- Nandina Avenue (Heacock to Perris)
- Heacock Street (John F Kennedy to Nandina)
- Nason Street (Eucalyptus to Cactus)



Exhibit 4-4: Backbone Network for Moreno Valley and Surrounding Area



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Chapter 5 Implementation

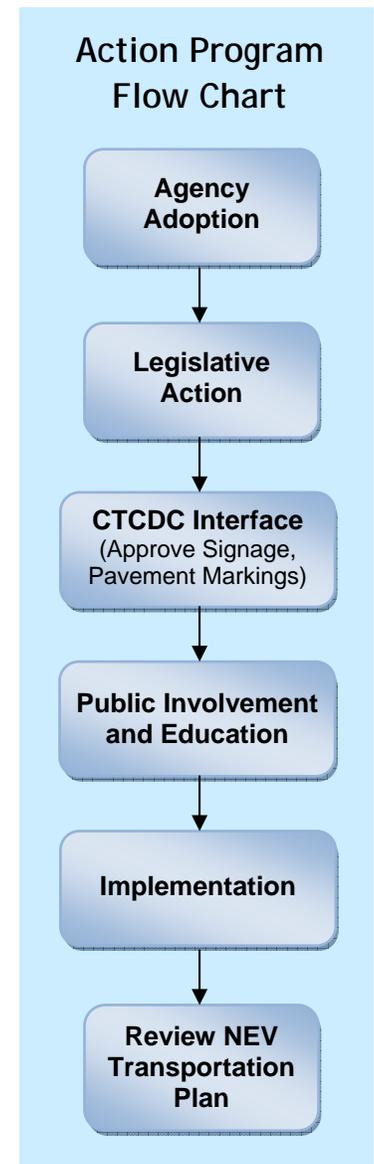
Overview

The WRCOG 4-City NEV Transportation Plan provides sufficient guidance for the cities of Corona, Norco, Riverside, and Moreno Valley to individually or collectively enable expanded use of NEVs in their respective communities through adoption of the Plan. The affected jurisdictions have participated in the planning process but are under no obligation to implement the Plan. The Plan can also serve as a template for other communities to consider NEVs in their transportation and lifestyle mix and development of their own local Plan.

Action Program

Implementation of the Plan is a multi-step process. This chapter outlines the following elements required for successful integration of NEVs:

- **Agency Adoption.** Local jurisdiction adopts WRCOG 4-City NEV Transportation Plan or their own locally prepared Plan for their respective community;
- **Legislative Action.** Legislative Bill (draft included as **Appendix E**) submitted to Legislature for approval, with an appropriate sponsor;
- **CTCDC Interface.** Signage, pavement markings approval obtained through CTCDC;
- **Public Involvement and Education.** Public Awareness Campaign outlining Plan, implementation schedule, education materials and policies;
- **Implementation.** Install any necessary street improvements (striping, signage, etc.) and opportunity charging stations as needed; and
- **Review Plan.** Commitment to revisit plan and assess effectiveness within an appropriate time frame (usually five years)



Agency Adoption

The WRCOG 4-City NEV Transportation Plan provides the basic information as a first step to broad NEV usage within the Plan area. Establishment of a Backbone Network is the most critical component of any Plan. This Plan was prepared with the intent, but not a requirement, that the participating jurisdictions support NEVs within their respective communities through adoption of this or a locally prepared Plan.

The Plan has been prepared consistent with standard practices. The recommended Backbone Network will function with individual City adoption but has the greatest effectiveness if all four jurisdictions embrace the Plan. Plan adoption is a multi-step process as outlined in the Action Program section above. Agency adoption consists of a formal Council action through Ordinance or Resolution as determined by local governance policies. Public input has been received through the process outlined in Chapter 3. An additional public hearing or workshop may be held if desired. The adopting agency's General Plan Circulation Element should be updated, when practical, to acknowledge NEVs and the planned Backbone Network.

Legislative Action

Template Legislation/Resolutions

Similar NEV legislative bills have been approved in the recent past, but each bill will have its own issues and concerns that need to be addressed or that may arise during the political process of passage of the bill. With the end of the two-year political session near, legislation to implement this plan should be introduced at the beginning of the next session. Consider the following:

- The legislation should include the 4-cities, Corona, Norco, Riverside and Moreno Valley.
- Contact local legislators and provide copies of this report and draft legislation. (see **Appendix E**)
- Determine which legislator will introduce the legislation.
- Legislation should state that this is a joint plan, but each jurisdiction may develop independently.
- Identify any potential opposition.
- Adoption of the plan for implementation by jurisdictions.

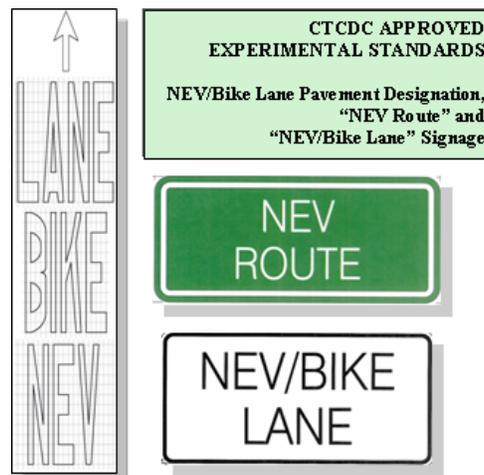
CTCDC Interface

If the jurisdictions implement an NEV transportation program and wish to establish uniform traffic control devices to inform pedestrians, bicyclists, and motorists of the presence of NEV traffic, then the California Traffic Control Devices Committee (CTCDC) approved experimental standards, as shown below are recommended.

Prior to implementation, approval from the CTCDC regarding usage of experimental signage and pavement markings within the 4-City area will be required.

Initial discussions with CTCDC staff have begun regarding the NEV Transportation Planning efforts. The CTCDC meets approximately quarterly to consult with local agencies and the public before adopting and approving rules and regulations prescribing uniform standards and specifications for all official traffic control devices in California.

In order to obtain approval from the CTCDC for these traffic control devices, a formal request and presentation must be made (concurrently or soon after NEV Transportation Plan Legislation for the 4-City Plan is obtained) before the CTCDC at one of their regular meetings. The next CTCDC meeting is scheduled for September 2, 2010 in Southern California. The deadline to submit an agenda item is July 12, 2010.



Public Involvement and Education

The development and implementation of a NEV Transportation Plan will be more successful if it garners community support. Public education and engagement are effective tools in developing this support.

Actions which can enhance community support of a NEV Transportation Plan include:

- Publish NEV route maps
- Engaging any current NEV users within the community
- Stakeholder group meetings between bicycle community, NEV users, and any other interested groups
- Holding community meetings to educate the public
- Inviting NEV manufacturers to provide test drives
- Developing online resources and brochures as educational tools which contain information on designated routes, parking and charging stations
- Involving local officials and law enforcement

Implementation

Each jurisdiction may have different options to fund the improvements necessary to implement a Plan. If Federal funds are used, prior to final design/implementation of a Plan, an environmental determination may be required by the administering agency. It has been our experience that for Phase I types of improvements that only require signage and striping, the project qualifies for a Programmatic Categorical Exclusion (PCE) under National Environmental Policy Act (NEPA), since it is usually evident that no significant environmental impacts could occur as a result of this type of road improvement. Typically, if the funds are administered through Caltrans, a Preliminary Environmental Study (PES) form with a description of the work proposed and an NEV Route Map is prepared and submitted to Caltrans for approval. Caltrans will in turn provide the jurisdiction with an approved PCE. Locally funded projects may require a different process based on each jurisdiction's internal procedures.

Review Plan

In this final step, the adopting jurisdiction(s) commit to revisit their Plan and assess the effectiveness of what's been implemented within an appropriate time frame (usually five years). A formal evaluation can be performed and information compiled in a NEV Transportation Plan Evaluation Report document distributed to governmental and local stakeholders for review. Included in the report would be various surveys (transportation analyses, and surveys of residents) to perform a formal evaluation of the effectiveness of the Plan elements, including their impact on traffic flows and safety.

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Study Appendices

Appendix A: Opportunities & Constraints Memorandum

Appendix B: List of Documents with Summaries

Appendix C: Stakeholder Survey

Appendix D: EXAMPLE NEV Parking and Charging Station Standards

Appendix E: Draft NEV Legislation for the 4-City NEV Transportation Plan

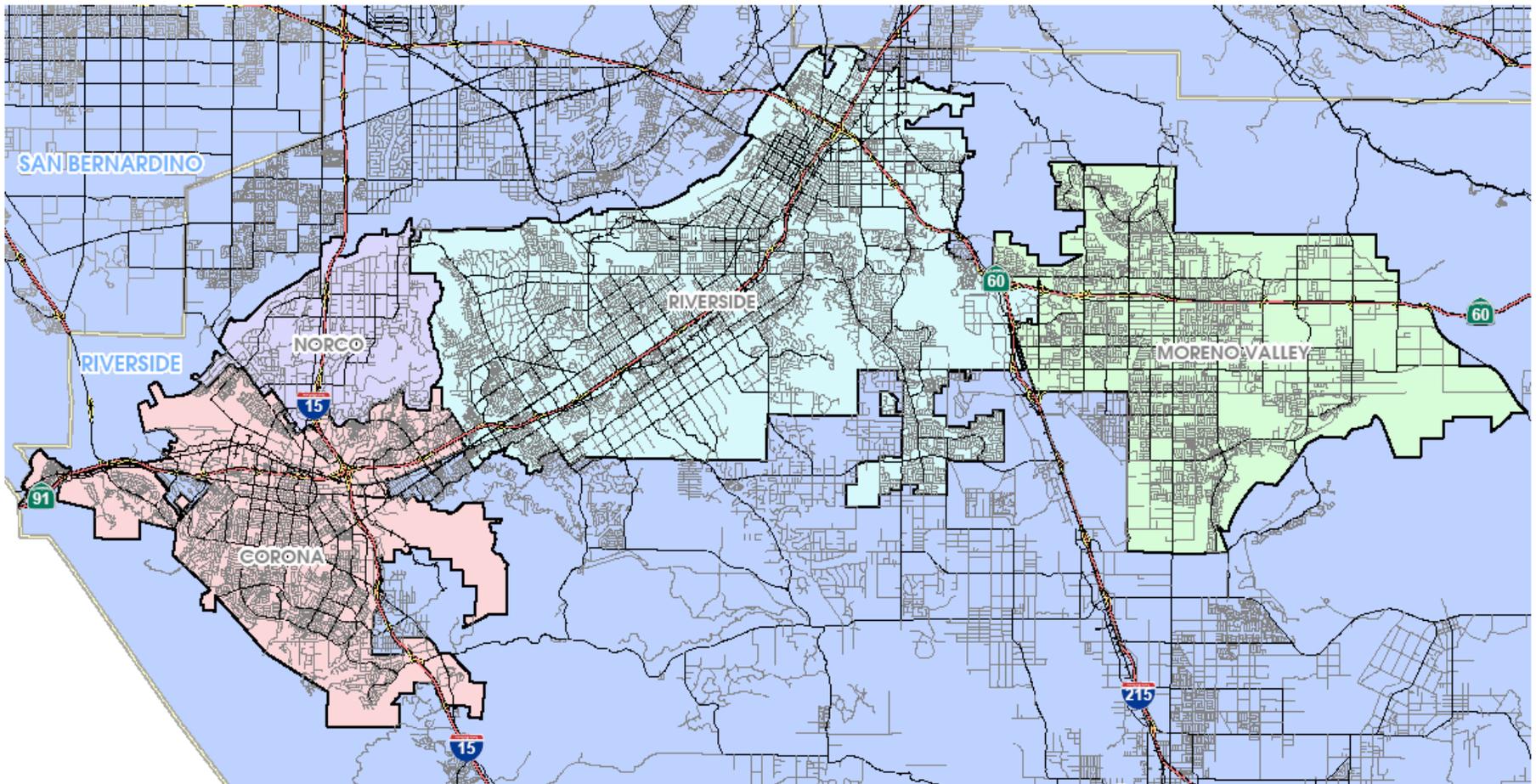


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Appendix A: Opportunities & Constraints Memorandum

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Opportunities and Constraints Memorandum

WRCOG 4-City Neighborhood Electric Vehicle Plan



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Opportunities and Constraints Memorandum

WRCOG 4-City Neighborhood Electric Vehicle Plan

Purpose Statement: To create near term and long range transportation network plans and scalable implementation strategies for deployment of Neighborhood Electric Vehicles (NEVs) in the Cities of Corona, Norco, Riverside, and Moreno Valley.

Overview

GIS datasets were compiled by Urban Crossroads to begin the mapping and planning process. Utilizing these datasets, this memorandum will serve as a brief inventory and analysis of existing:

- *Local and Regional Destinations* - including population density, employment density, and places of interest;
- *Circulation* – posted speed limits, bicycle, and transit plans;
- *Existing NEV Plans*;
- *Opportunities and Constraints* in the Cities of Corona, Norco Riverside, and Moreno Valley (4-Cities).

This memorandum, and all data gathered to this point, will help shape the goals and objectives discussion at Oversight Committee and Working Group meetings.

NEVs are a street legal, low cost, energy efficient, zero direct emission mode of local travel that is here to stay, however, impediments to widespread use include:

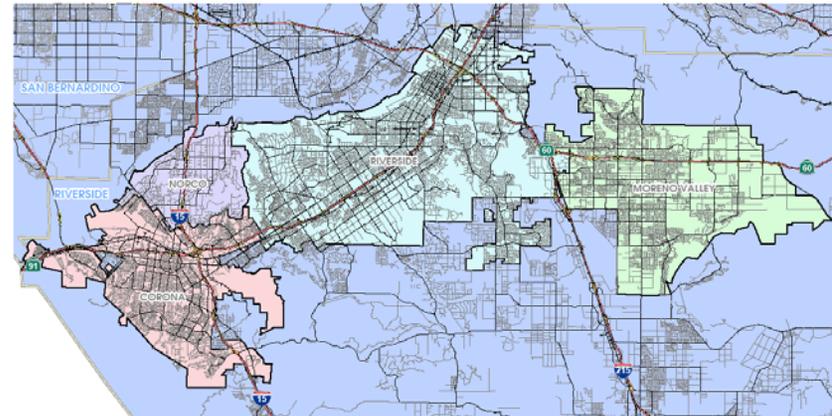
- Lack of Interconnected Low Speed Routes – NEV plans are needed to overcome connection issues and identify safe routes.
- Driver Confusion - NEV plans enable clear communication about which routes to take.

These concerns can be overcome in established cities and contiguous groups of cities by the implementation of integrated, local NEV planning.

Benefits

There are many benefits associated with NEV transportation planning. They include increased connectivity within communities, increased mobility, environmental benefits, safety, and cost savings to NEV users.

Connectivity: Well-planned communities utilize transportation plans that connect people with places. Routes should connect neighborhoods, commercial



areas, schools, other modes of transportation, downtown and recreation areas. Since NEVs have a range of about 30 miles, residents are more inclined to use local services and shop locally. Refer to **Appendix A** for detailed information about NEVs.

Mobility: For many communities, the automobile remains the dominant mode of travel and a quarter of all car trips are less than one mile. NEVs provide a clean transportation option, particularly for short trips on low-speed and low-volume roads. NEVs can also provide cost effective mobility for people who prefer not to, or cannot drive a conventional automobile.

Environmental Benefits: NEVs operate by battery power. This energy source produces no tailpipe greenhouse gas emissions and air contaminants, which contribute to global warming and air pollution. NEVs can enrich communities by enabling people to travel cleanly, and the vehicles can enhance the “neighborhood feel” of a community.

Safety: NEVs must be equipped with basic safety equipment including: headlights, rear lights, brake lights, turn signals, rearview mirrors, reflex reflectors, parking brake, windshields, and seatbelts. With these safety features, NEVs offer more protection than a basic golf cart or a bicycle. Drivers of NEVs must possess a valid driver’s license, vehicle registration and insurance. The low speed in which NEVs travel is much safer than a high-speed conventional vehicle.

Local and Regional Destinations

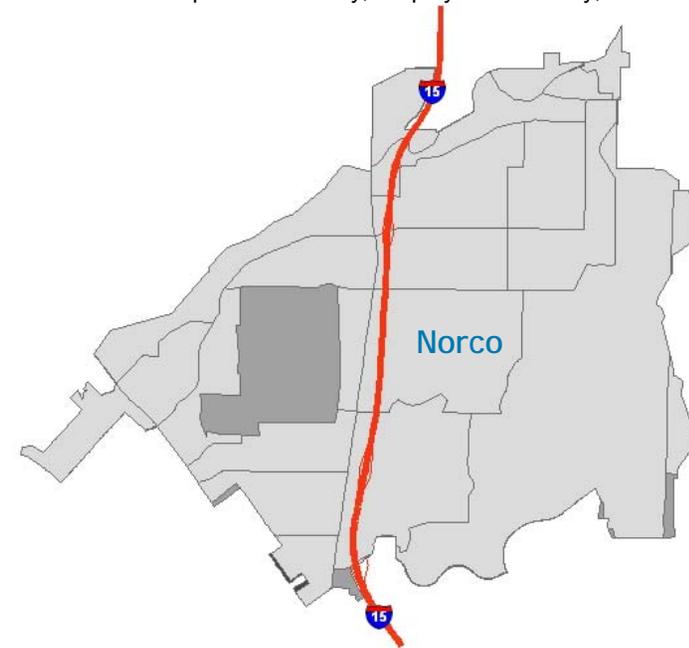
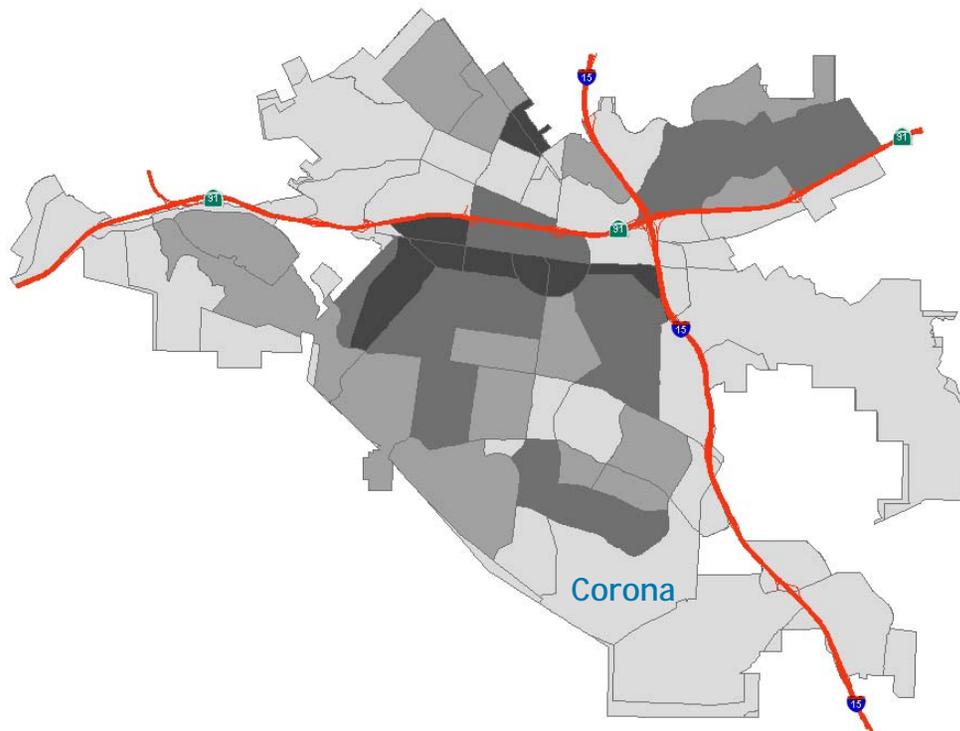
To summarize the existing local and regional destinations in the 4-Cities, datasets were compiled that include: Population Density, Employment Density, and Places of Interest as they exist today.

Population Density

By recognizing where people live and comparing it against employment and activity centers, places of interest, and distances to key destinations, the framework for what ultimately will become an NEV Transportation Plan will take shape.

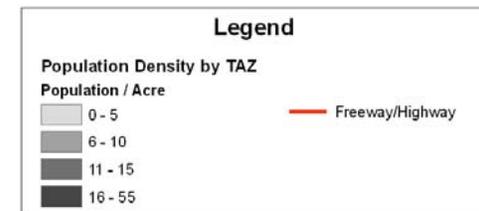
Corona

As shown in the map below, population densities are higher near the downtown area and northeast of the Interstate 15 (I-15) / State Route 91 (SR-91) interchange.



Norco

As shown on the map above, the highest concentration of population is centered west of I-15 near the Riverside Community College Norco campus.

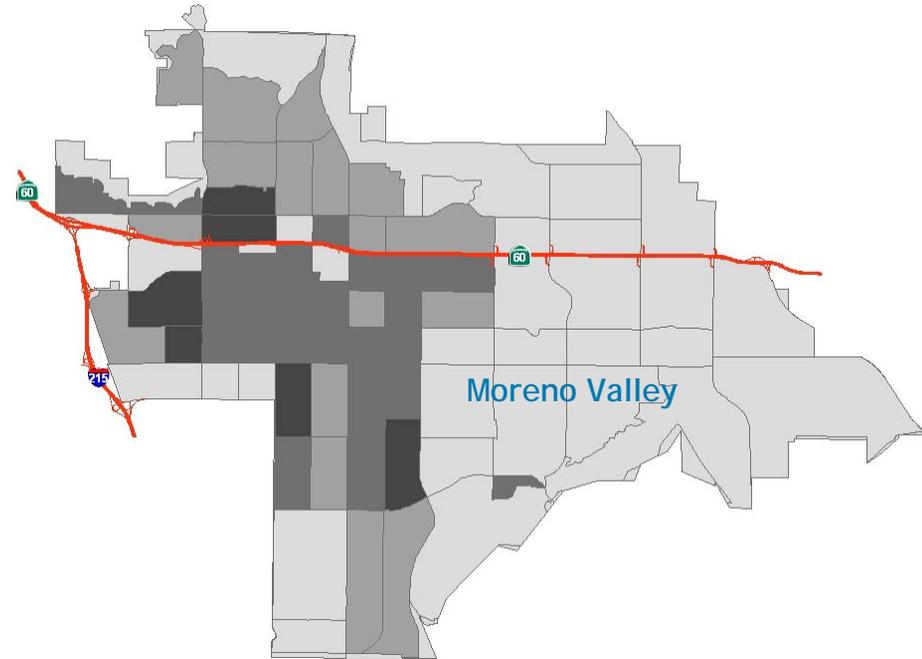
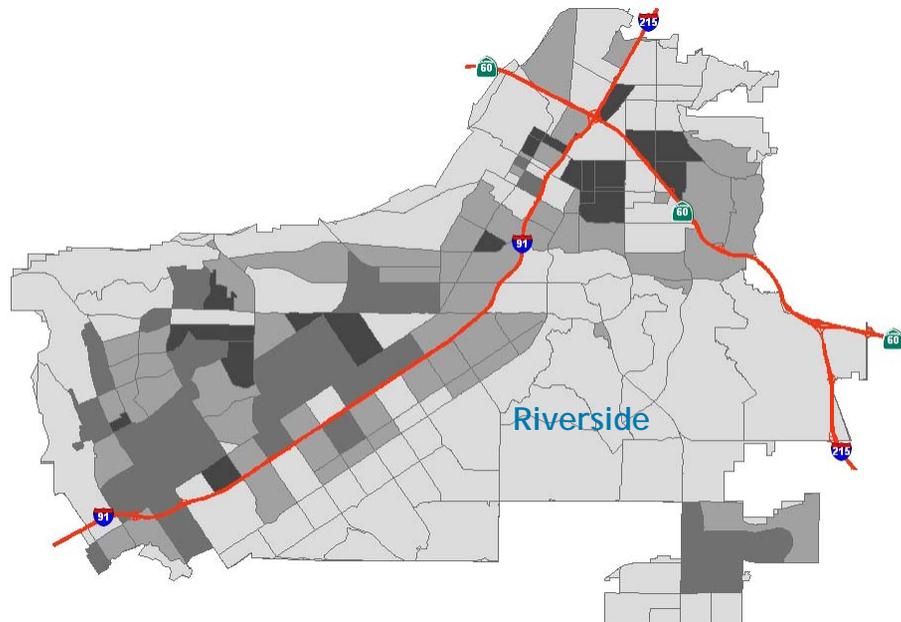


Population Density

Riverside

In the City of Riverside, the higher concentration of population is bounded by the areas north of SR-91, south of Arlington Avenue and to the east of La Sierra Avenue. As provided later in this memorandum, there are several places of interest including La Sierra University, California Baptist University, several medical facilities, and shopping centers.

There are also other areas of significant population including the area near University Avenue, and near the University of California, Riverside.



Moreno Valley

As shown in the above map, population densities are higher on the west side of the City, in particular to the north and south of State Route 60 (SR-60) between Interstate 215 (I-215) to the west, and Lassel Street to the east.

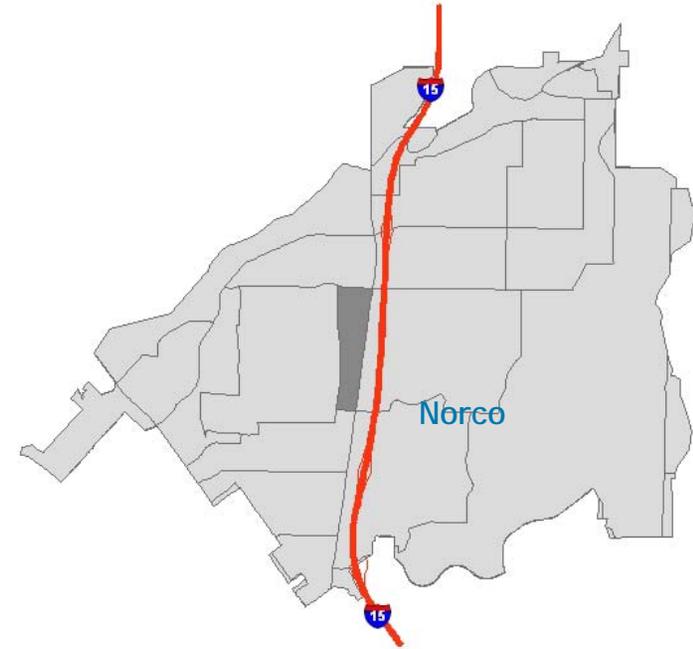
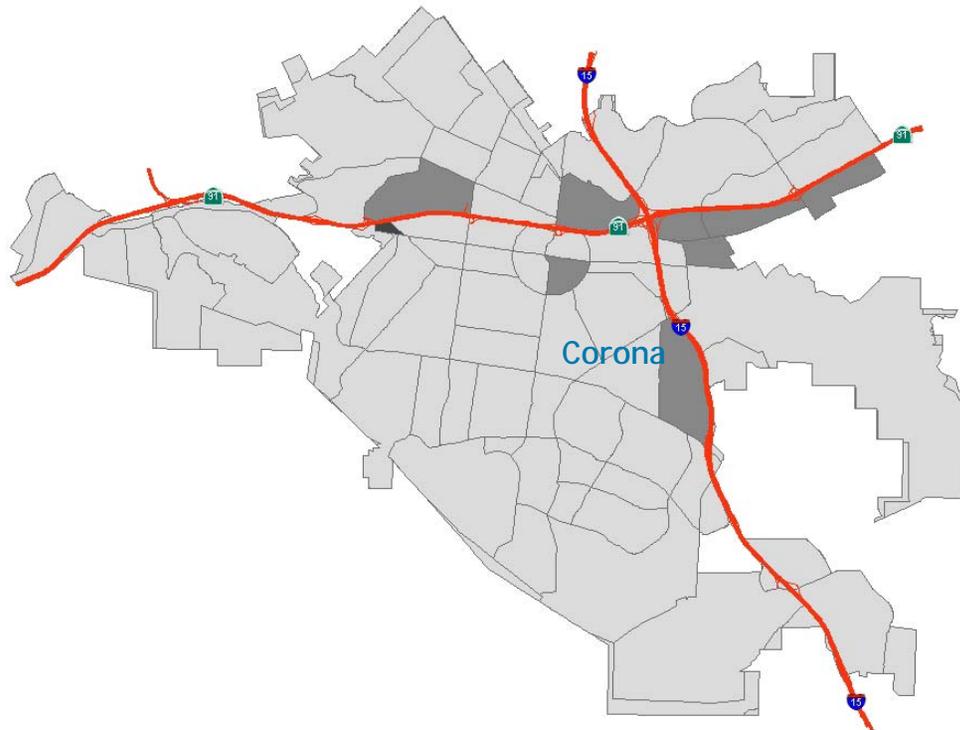


Employment Density

Identifying employment centers and comparing them against where people live, can be used as a consideration in guiding NEV routes. The information presented is sensitive to the size of RIVTAM zones and represents simplified graphic depictions of data.

Corona

As shown in the map below, the higher employment densities in the City of Corona are predominantly oriented along freeway corridors including to the east, between SR-91 and Magnolia Avenue, just north of downtown; the area between Corona Municipal Airport and SR-91; and southeast of downtown between I-15 and California Avenue.



Norco

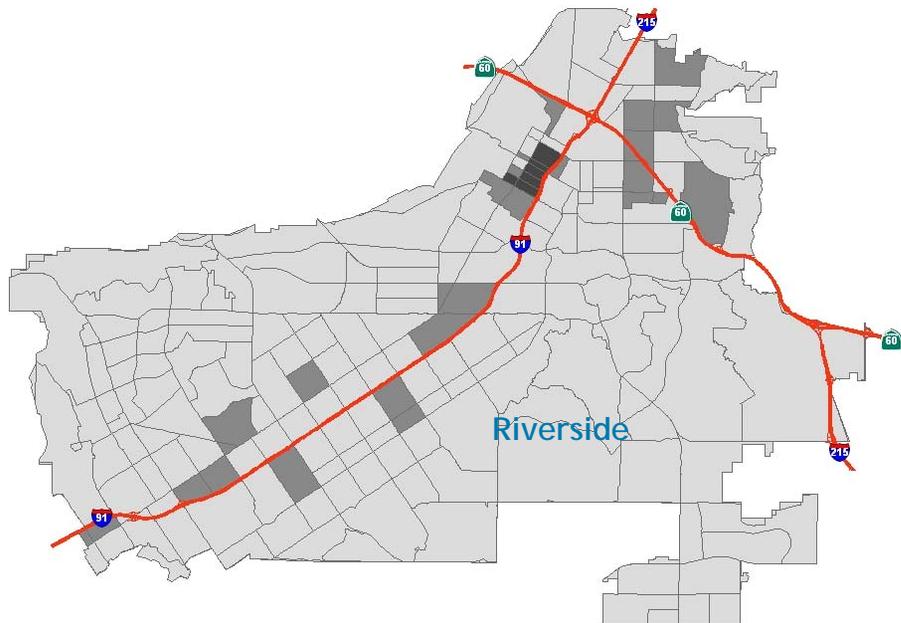
In the City of Norco, there is a concentration of employment located to the west of I-15, just west of Hamner Avenue between 5th Street and 3rd Street.



Employment Density

Riverside

The highest employment densities in the City of Riverside are located near downtown and near the University of California, Riverside. Moderate areas of density are located adjacent to SR-91 and Magnolia Avenue.



Moreno Valley

Employment concentration in Moreno Valley is not adequately reflected in currently available data. The consultant team will continue to work with WRCOG and city staff to resolve this issue. Moderate areas of density are located along major commercial corridors and in the vicinity of March Reserve AFB.

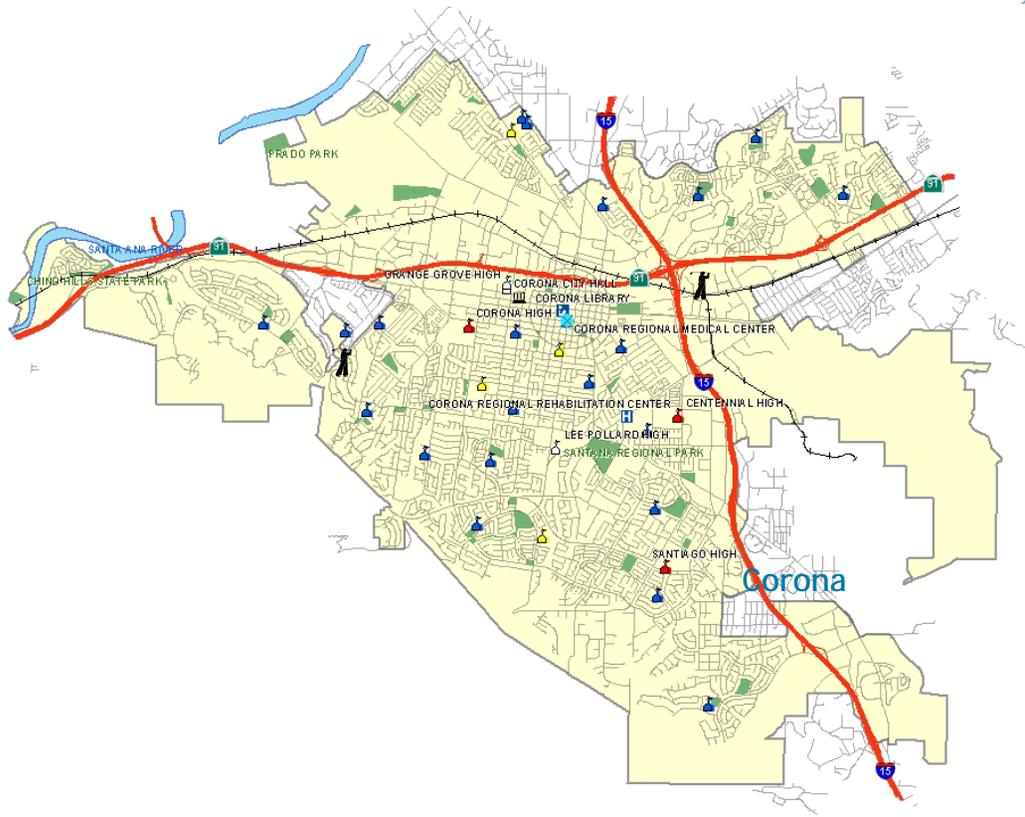


Places of Interest

Linking Places of Interest such as shopping, recreation, medical, and education facilities, to where people live and work will be used as a tool to assist the project team in examining these roadways that connect these facilities for safe NEV travel.

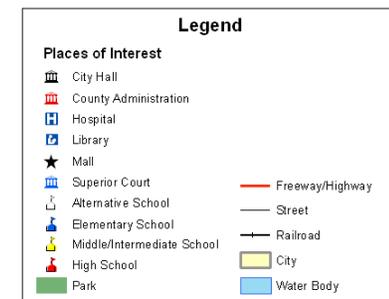
Corona

As shown in the map below, most of the activity centers, such as City Hall, Medical Centers, and nearby schools, are located south of SR-91 and west of I-15. Dos Lagos and Corona Crossings are two major shopping/lifestyle centers located in southeast Corona but not yet reflected on the graphic.



Norco

Downtown Norco, City Hall, Riverside Community College's Norco campus and JFK High are all located just west of I-15 near Hamner Avenue.

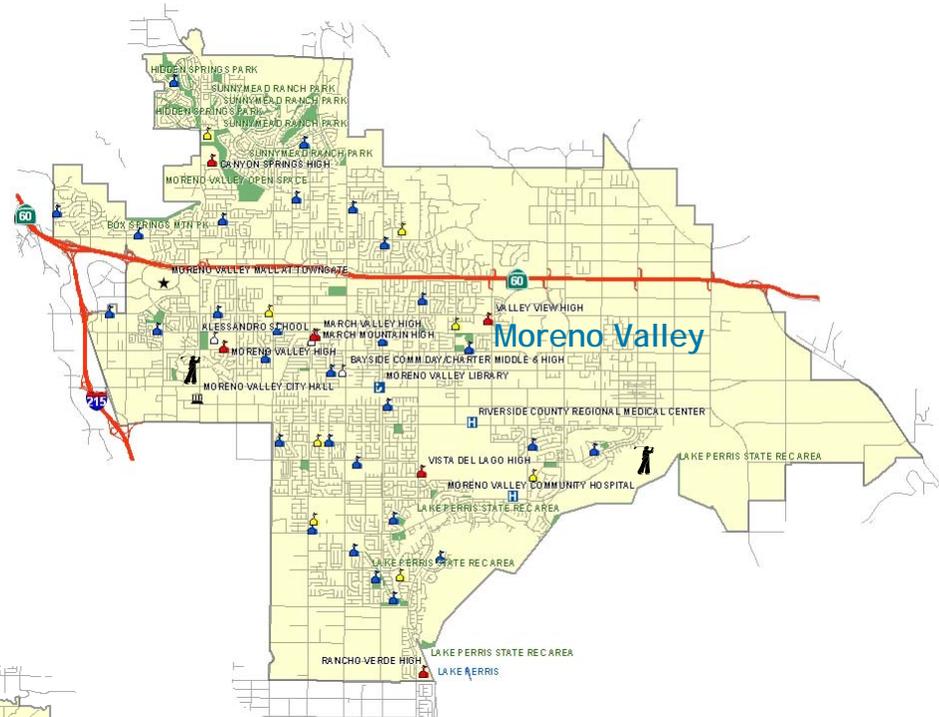
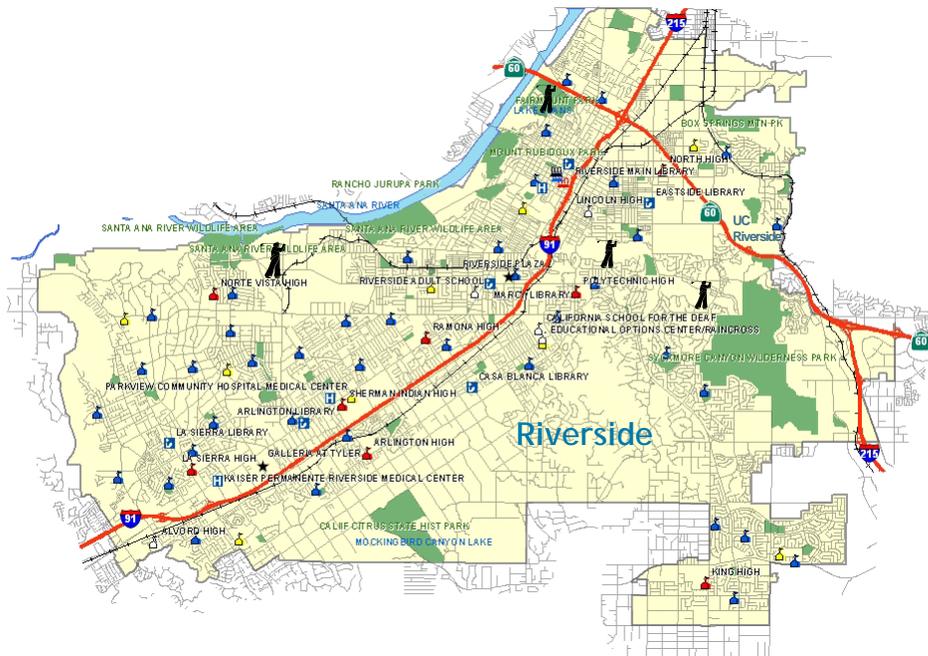


Places of Interest

Riverside

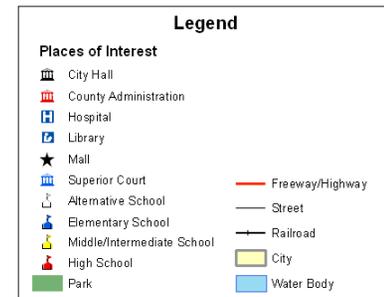
As shown on the map below, there are several areas of activity concentrated in Riverside. They include:

- Kaiser Permanente Riverside Medical Center, and Parkview Community Hospital Medical Center, to the north of SR-91.
- Several parks along the Santa Ana River
- Two large parks – Sycamore Canyon Wilderness Park near I-215; and California Citrus State Historic Park south of SR-91
- The highest concentration of schools is located to the north of SR-91
- Several Golf Courses = 
- Downtown Riverside
- University of California, Riverside



Moreno Valley

- As shown on the map above, located in the northern corner of Moreno Valley, there is a concentration of parks
- The Moreno Valley Mall at Towngate
- Canyon Sprints Plaza Shopping Center
- The Festival at Moreno Valley Shopping Center
- Riverside County Regional Medical Center
- Kaiser Moreno Valley Community Hospital
- Moreno Valley Golf Club



Circulation

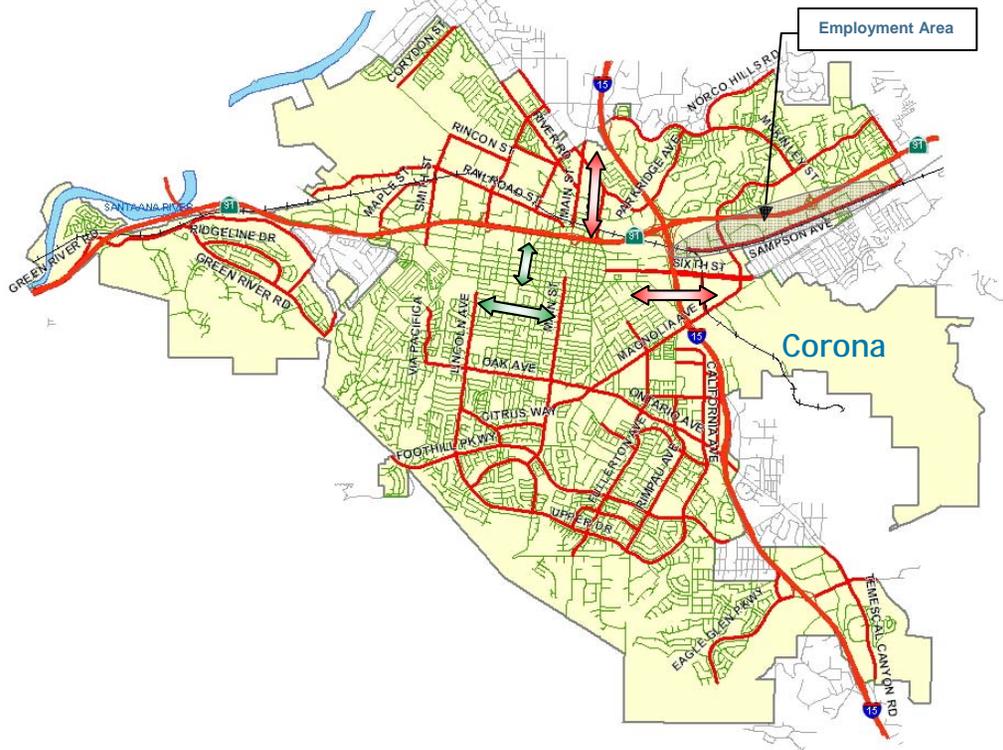
To summarize the Circulation elements of the 4-Cities, datasets were compiled that include: **Posted Speed Limits, Bikeway Plans, and Transit Facilities.** Implementation of NEV Transportation Plans will allow for safer NEV travel throughout the Cities of Corona, Norco, Riverside, and Moreno Valley. The development of NEV Transportation Plans will offer a transportation alternative to driving and cycling, and could reduce regional car trips. During the next phase of the project development process - NEV transportation planning and preliminary engineering - coordination with local traffic engineering, public works, local law enforcement, and community feedback will assure the NEV routes are safely designed.

Posted Speed Limits

This section looks at each City at a glance and identifies those streets with a posted speed limit of 35mph and less where NEV travel is legal.

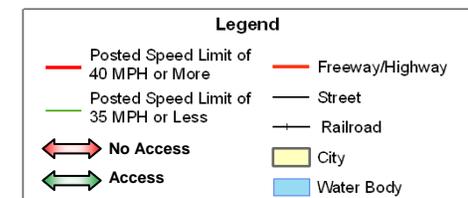
Corona

As shown in the map below, to the south of SR-91 there is a NEV-friendly street network connecting downtown to nearby residential communities, however access is currently limited on the main streets to Norco and Riverside, and to employment concentration areas, to the east of I-15.



Norco

Most of the City is composed of streets with speeds of 35mph or less, allowing NEVs to travel safely throughout the City. There are a few streets, however, that prevent north-south connection to Corona, and east-west to Riverside. These connections will require further study. There are no direct connections on existing streets without exploring opportunities to retrofit those streets to allow safe NEV travel. For example, the most direct route to Corona is on Hamner Avenue.

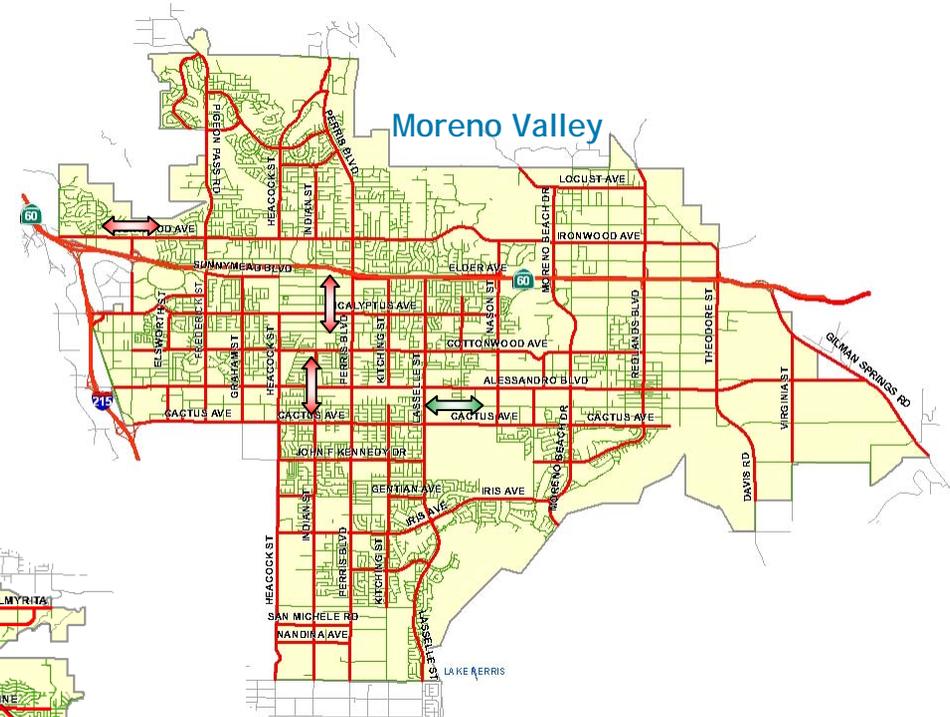


Posted Speed Limits

Riverside

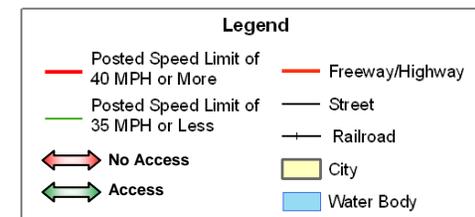
There are no contiguous streets at or less than 35 mph that would allow ease of NEV travel throughout the City. As shown on the map below, connectivity to shopping, employment centers, hospitals, and local educational centers, on streets posted at or less than 35 mph, is limited.

NEVs can legally operate in small geographical areas throughout Riverside, but are not able to travel for more than a couple miles before encountering barriers such as higher speed roadways that prevent connectivity to where people live and popular destinations. However, there appears to be opportunities on sections of Magnolia Avenue for example, that can be used to accommodate NEVs in bike lanes for short stretches to provide the connectivity.



Moreno Valley

As shown on the map above, Moreno Valley appears to have the most dense grid of roads with a posted speed limit of 40mph or more among cities in the study area. Identification of lower volume east-west corridors for Class I treatment can improve connectivity.

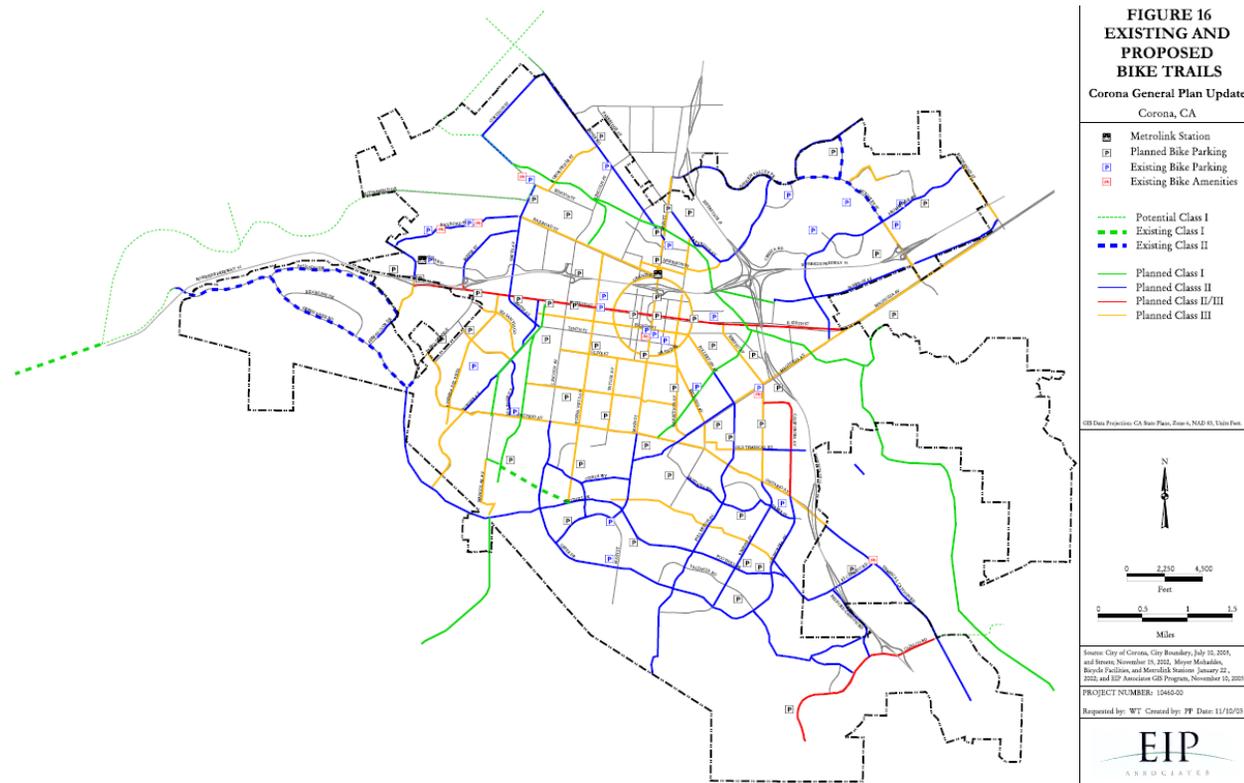


Bikeway Plans

This section illustrates the bikeway plans for each City. (Norco Bikeway Plan not available.) Those streets with posted speed limits of over 35mph that have Class II bike lanes, or a plan to include them, are streets that may be retrofitted to accommodate NEV travel.

Corona

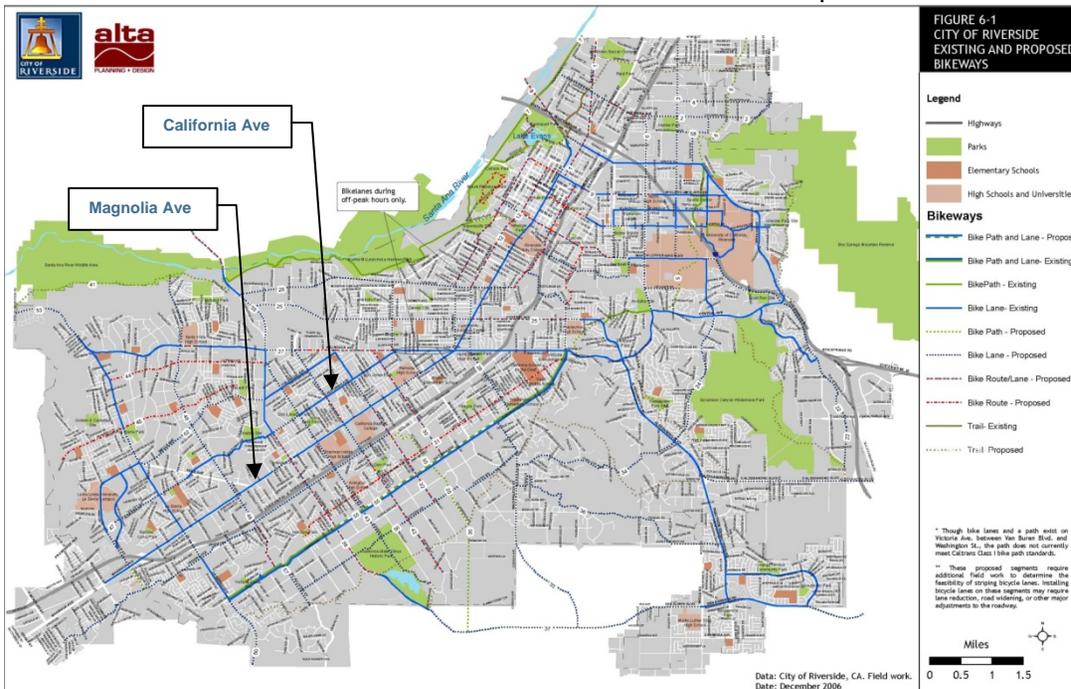
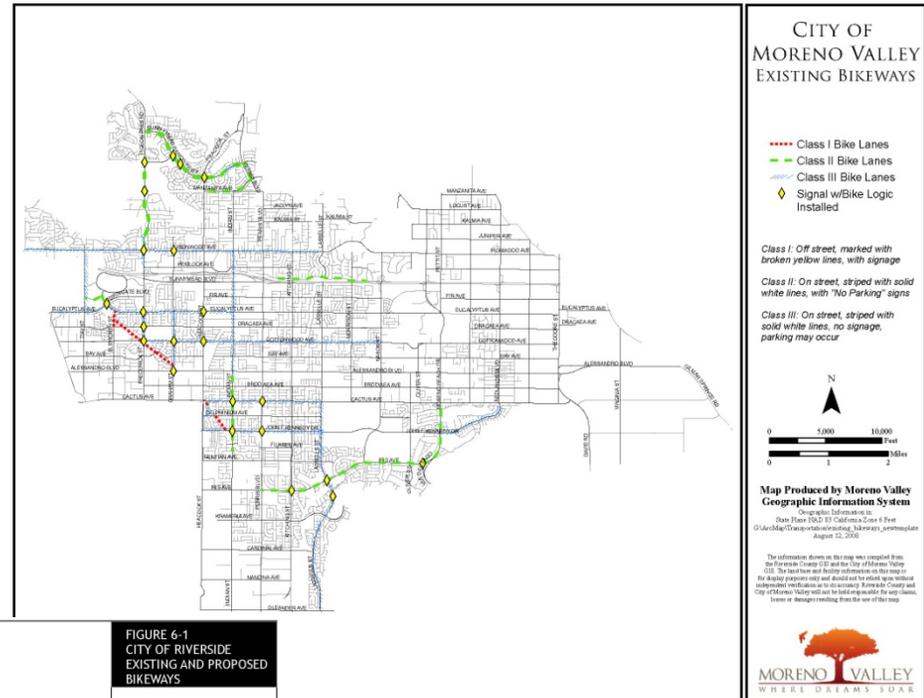
There appears to be some opportunity in Corona to convert planned Class II bike lanes to NEV/bike lanes to provide NEV route connectivity. As shown in the map below, 6th Street at Magnolia Avenue should be considered for further study as part of the next phase of this project.



Bikeway Plans

Riverside

As shown on the map below, existing and proposed Class II bike lanes on 4-lane arterial streets with posted speed limits above 35mph may provide opportunities to extend NEV routes to areas otherwise inaccessible to NEVs. Good examples of such streets are Magnolia Avenue and California Avenue, which provide opportunities for NEV/bike lane routes. Additionally, these roadways provide the connectivity to downtown, and activity and employment centers.



Moreno Valley

As shown on the map above, Moreno Valley has limited existing Class II bike lanes, however where they exist, it provides an opportunity to explore shared NEV/Bike lanes if connectivity is desired.

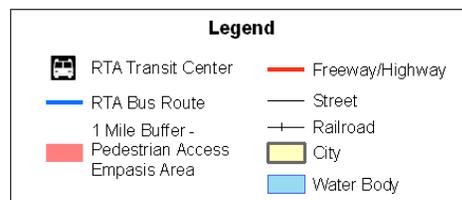
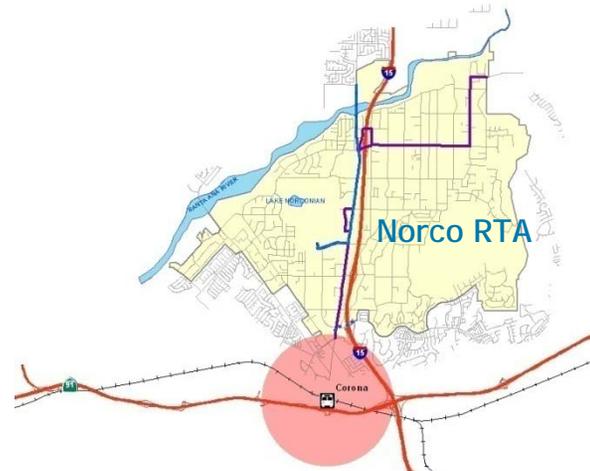
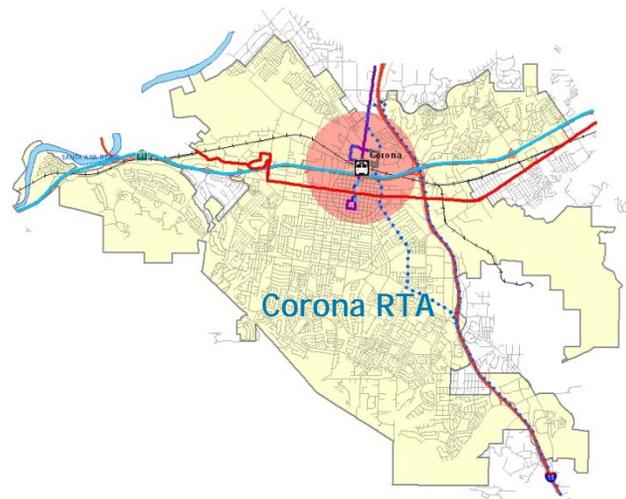
Transit Plans

The following maps provide the locations of existing and future transit centers and MetroLink Centers for the 4-Cities. NEV access to these facilities may provide the additional incentive for choosing NEVs as an alternative mode of transportation.

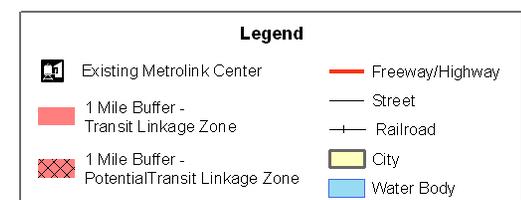
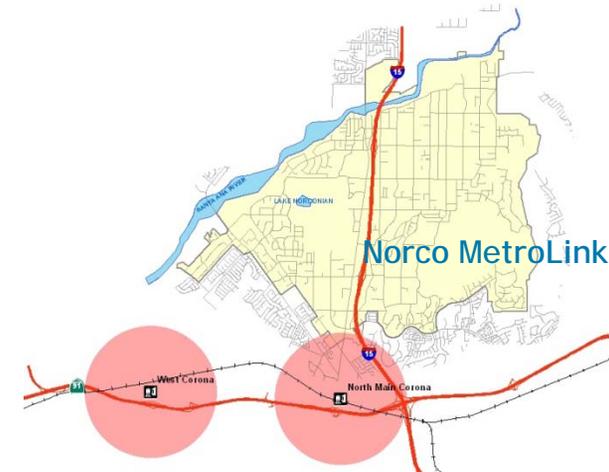
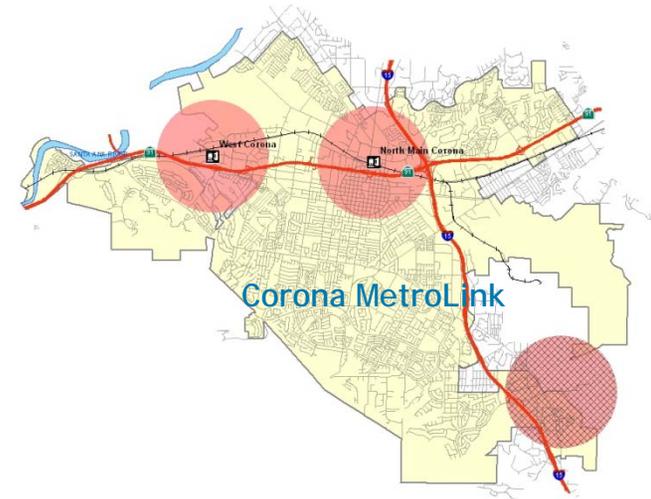
Corona

Norco

RTA



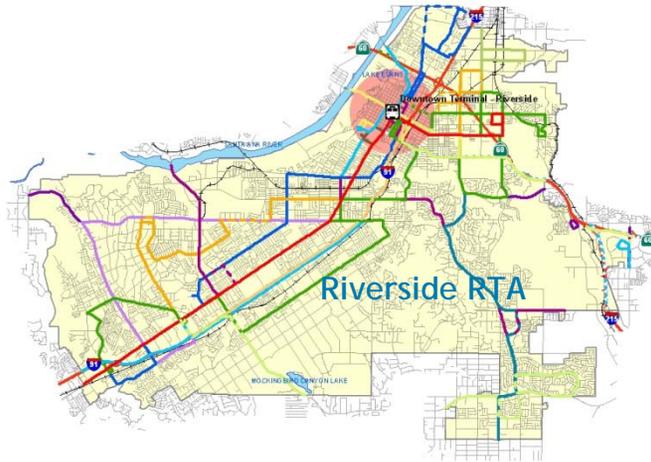
MetroLink and Potential Future Transit



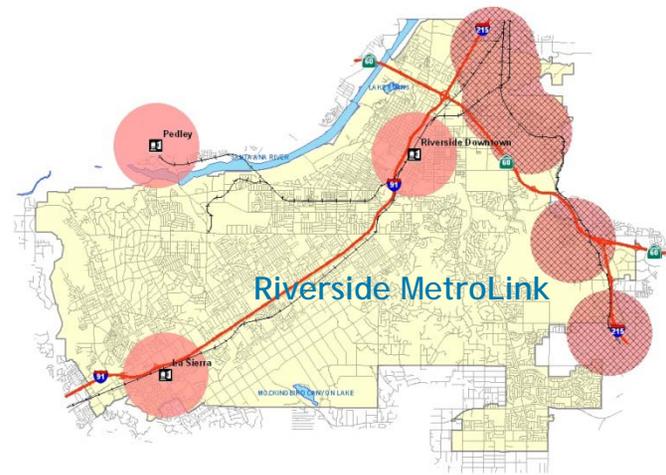
Transit Plans

Riverside

RTA

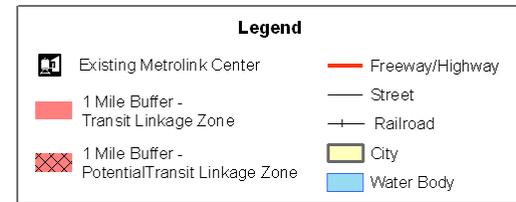
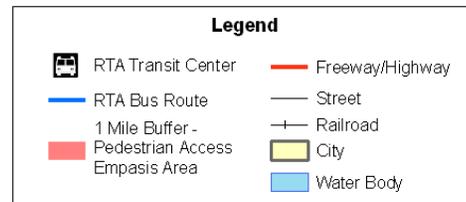
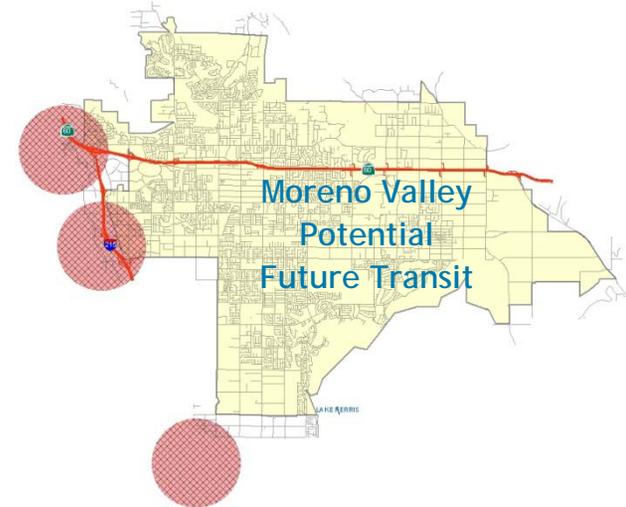
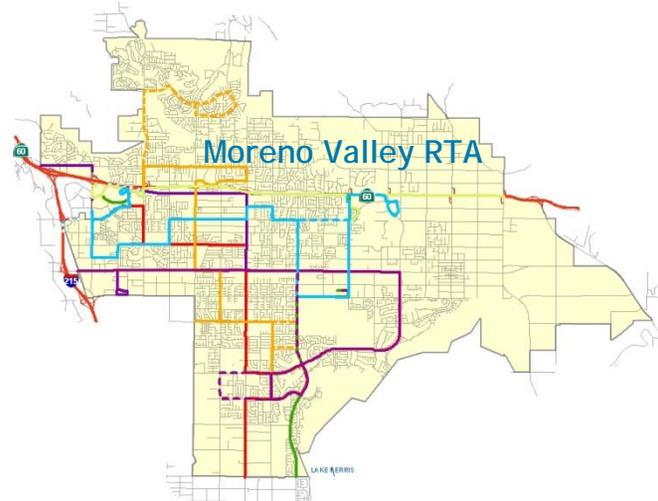


MetroLink and Potential Future Transit



Moreno Valley

Moreno Valley RTA



Existing NEV Transportation Plans

This section includes a summary of other similar Alternative Transportation Corridors across the country.

The following California communities have established golf cart and NEV usage:

[Source: The Ranch Plan Sustainable Circulation Plan. Summary of Bicycle and Neighborhood Electric Vehicle Components. Fehr & Peers (2006)]

- City of Lincoln*
- City of Rocklin*
- City of Palm Desert*
- Rancho Mission Viejo*
- Otay Ranch
- Playa Vista near Los Angeles
- City of Laguna Woods
- Rancho Murieta

The following are examples of cities outside of California that have established golf cart/NEV usage:

- City of Peachtree, Georgia*
- City of Mesa, Arizona
- City of Phoenix, Arizona
- Celebration, Florida

*Summary of this community is included in this Section

City of Lincoln, California

A Class I two-way pathway located in the City of Lincoln (pictured top left) is approximately 12-feet wide, and connects a neighborhood development to a local shopping center. This path is used by golf carts, NEVs, pedestrians, and bikes.

Funding for the City of Lincoln’s NEV Transportation Plan was acquired through Sacramento Area Council of Governments (SACOG) which resulted in an allocation totaling over \$800,000. Placer County Air Quality Control Board (PCAPCD) funding assistance was also awarded for the project. Local funding sources included Thunder Valley Casino and other local merchants. Ongoing maintenance of the corridors comes out of the City’s General Funds.

In Lincoln, NEVs are commonly used for leisure trips, picking up and dropping off students at school, and other errands around town.

Design is also underway for a NEV/bike/ped two-way path that will include a bridge over Auburn Ravine to connect downtown Lincoln to Sun City Lincoln Hills. This path will be about 20 feet wide.

NEVs share lanes with bicycles on special Class II NEV/bike lanes (pictured top right) where the speed limits on roadways exceed 35mph or traffic volumes are high. The Cities of Lincoln and Rocklin obtained special legislation (Assembly Bills AB 2353 and AB 2963) allowing them to do this. There have been no reported accidents since the NEV Transportation program began in 2006.



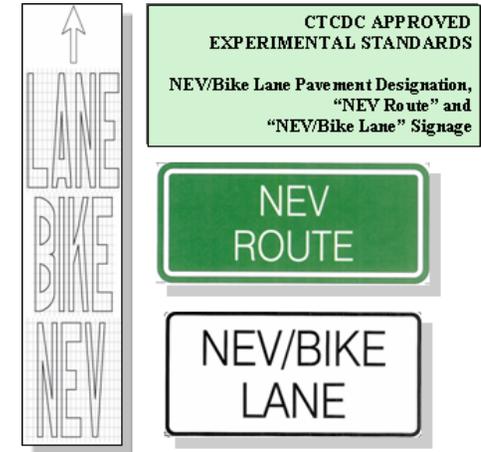
Class I pathway in Lincoln, CA



NEV on NEV/Bike Lane



NEV outside Middle School



City of Rocklin, California

The City of Rocklin’s NEV Transportation Plan is an effort to accommodate the City’s changing urban lifestyle by encouraging the use of bicycles and NEVs to travel from their home to the Rocklin commercial areas. This effort will result in air quality improvements, energy savings, reduced travel costs, and increased mobility and independence for aging or impaired drivers. The City of Rocklin’s project funding includes Congestion Mitigation Air Quality (CMAQ) funding and City local funds.

Modifications to the existing street and circulation system are underway to accommodate NEVs. The City is currently placing route signage (pictured bottom right) and creating special parking spaces, to develop a Class II NEV route system that will facilitate access throughout the City of Rocklin, and to increase safety.

The overall goal is to complete a comprehensive NEV circulation system that provides an alternative mode of transportation option for existing residents and new developments planned for Whitney Ranch and the downtown area.

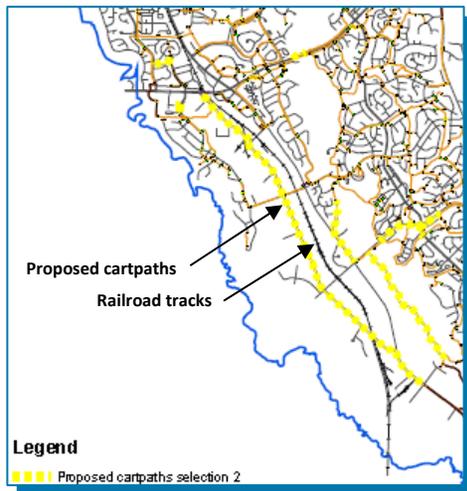
City of Peachtree, Georgia

Peachtree City, Georgia has a unique system of paved recreational paths that are enjoyed by pedestrians, bicycles, golf carts, and NEVs. The development of the pathway system began in the late 50's, early 60's by City engineers.

Existing path infrastructure includes:

- 84 miles of paved paths, approximately 160 miles of roads that allow golf carts for a total path network spanning 244 miles
- 10,400+ registered golf carts
- 2 bridges spanning state highways
- 17 tunnels underneath collector roads

Peachtree City has 37,000 residents/13,600 households, and survey data consistently indicates that 97% to 98% of residents/households use the paths in some form. LSVs/NEVs are far fewer in number than golf carts. NEVs are allowed on paths in restricted mode (slow-speed golf cart mode).



Peachtree, GA Multi-use Path System

The Class I two-way paths are a minimum of 10-feet wide. All modes share the paths at the same time. Peachtree City is working to widen paths based on traffic levels and budget - busiest paths get widened first. The network of paths connects neighborhoods, retail centers, churches, schools, and recreation areas, using tunnels and bridges to safely cross major thoroughfares. Peachtree City published its Street and Path route map in Fall 2006 and it is available online for download ["Path System and Golf Carts" Peachtree City. <<http://www.peachtree-city.org/index.asp?NID=216>>. (2009)].

Residents are not prohibited from using the paths at night, nor is special lighting provided. However, bicycles, golf carts, and NEVs must have lights. Law enforcement monitors the paths, and they log an average of 90 hours per month patrol time.

City of Palm Desert, California

Senate Bill 663 went before a hearing on April 14, 2009 that would authorize the City of Palm Desert to establish a Neighborhood Electric Vehicle Transportation Plan similar to the City of Lincoln and City of Rocklin's plans. None were opposed.

The City of Palm Desert's Golf Cart Transportation Program is intended to help develop a convenient transportation system that is safe and environmentally sensitive, generating zero auto emissions. Authorized on January 1, 1993, by California Assembly Bill 1229, the program has expanded the use of golf carts beyond transportation in and around golf courses and other recreational amenities by allowing carts on more public streets and private roads [City of Palm Desert "Golf Cart Transportation Program". <<http://www.cityofpalmdesert.org/Index.aspx?page=225>> (date accessed: March 30, 2009)].

In Palm Desert, permitted drivers are allowed to use golf carts for travel to schools, parks, businesses, shopping centers, and government offices. The program's long-term goal is to provide full golf cart access throughout the community.

Neighborhood Electrical Vehicles (NEVs) are not allowed in the Golf Cart/Bike Lane paths in Palm Desert. Only golf carts licensed by the City or the State are allowed to use the paths.

Rancho Mission Viejo, California

One of the key sustainability elements of the Rancho Mission Viejo planned development, ("Ranch Plan"), is the inclusion of a NEV system. The NEV system will support travel by low-speed electric vehicles primarily within planning areas but also to some extent traveling between planning areas and potentially external destinations.

The off street NEV element would consist of Class I facilities. These trails would provide connections between adjacent Planning Areas as well as facilitate internal local circulation within planning areas. The off-street NEV facilities adjacent to higher speed roadways would largely serve shorter trips within the Ranch Plan. These facilities would be for combined use by bicyclists, pedestrians, and NEVs. The off-street NEV facilities, when adjacent to a regional bikeway, are intended to serve trips between Planning Areas. The NEVs would be physically separate from the regional bikeway as described in more detail in the Fehr & Peers 2006 Study "The Ranch Plan Sustainable Circulation Plan Summary of Bicycle and Neighborhood Electric Vehicle Components."

Opportunities & Constraints

Opportunities

Opportunities are conditions that support or enhance the development of NEV transportation within a city. These include, but are not limited to, roadway networks with posted speed limit of 35mph and under; available right of way width to retrofit lanes or add Class II NEV/bike lanes especially on those streets with posted speed limits above 35mph; proximity to activity centers such as shopping, medical facilities, schools, colleges, parks, and golf courses.

Each of the 4-Cities offers the following site opportunities that should be built upon:

- **Existing Road Network** – As shown on the Posted Speed Limit maps in the Circulation section of this memorandum, each of the four cities have unique opportunities for intercity NEV travel, and for retrofitting higher speed streets (some collectors and arterials) to allow NEV/bike use. The advantage of sharing the bike lane is that bike lanes already exist in many areas and can be easily retrofitted for NEV traffic. Some of the retrofitting options include: reducing speed limits, providing NEV lanes in parking channels or road shoulders, reducing travel lanes to accommodate NEVs within existing bike lanes, or additional paved areas, which can be constructed to accommodate NEVs, either on-road or off-road.
- **Legislation** – Existing laws restrict the use of bicycle paths by all motor vehicles. With current legislation in various cities across the State of California, the Cities of Corona, Norco, Riverside, and Moreno Valley can take advantage of existing language to draft their own legislation.
- **Traffic Controls** – The California Traffic Control Devices Committee (CTCDC) has approved experimental signage, stripping and pavement markings for NEVs, and combined NEV/bike lanes which have been used successfully in the California Cities of Lincoln and Rocklin. Once legislation is obtained to develop and implement NEV transportation plans, CTCDC approval can be obtained for the 4-Cities.
- **Access to Downtown** – Within each City, many pockets of streets currently exist to provide good access to certain downtown areas and activity centers from nearby neighborhoods.
- **Transit Access** – RTA transit provides access to most parts of each city and MetroLink Centers parallel State Route 91 through the Cities of Corona and Riverside. This network provides an opportunity for commuters to drive their NEVs to MetroLink or RTA transit centers, and travel longer distances as an alternative to automobile use.
- **NEVs in the Community** – NEVs are currently being utilized in the community by law enforcement in the downtown Riverside area.
- **Recreation** – There are currently many opportunities to utilize existing networks and build new networks to optimize NEV use when travelling to parks, golf courses, and other recreation areas.
- **Charging Stations and Preferential Parking** – The City of Lincoln, in partnership with local commercial/retail centers, has had success with accommodating NEVs by providing charging stations (110V outlets) and preferential parking near store fronts to encourage and promote local spending. There are opportunities within the 4-Cities to propose similar strategies.

Constraints

Constraints are conditions that may hinder the functionality of an NEV route. These include, but are not limited to, higher speed roads (above 35mph), rail and freeway crossings, insufficient right of way to retrofit streets with posted speed limits over 35mph, and high volume/high speed roadways that make NEV travel unsafe.

Constraints that could be overcome or minimized include:

- **Streets with higher than 35mph speed limits** – As shown on the Posted Speed Limit maps, there are many roadways with higher speeds preventing continuity for NEV travel, especially across town or to popular destinations, without going out of the way and maneuvering through a maze of streets to reach the intended destination. This may negatively impact the experience of using an NEV.
- **On street parking** – Support for losing on street parking to accommodate NEVs may be challenging.
- **Interstate barrier** – Interstates 15 and 215, and State Route 91 separate neighborhoods from employment, shopping, and medical centers and are connected by higher speed roadways.
- **Railroad / transit crossings** – Special consideration must be taken when crossing rail/transit facilities. Some streets become narrow when crossing these facilities.
- **Bicycle User support** – NEV and bicycle lane shared facilities may be feasible, but it may not be acceptable to some bicyclists if it is adopted as a general policy within the 4-Cities. Commingling may not be appropriate when bicycle or NEV use is high.

Appendix A

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. The NEV is 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 limits of 35 mph or less.

NEVs are 100% battery-electric powered vehicles. Factors that can affect the driving range include: 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 below, used under proper conditions with fully charged batteries, can travel approximately 30 miles on a charge.



GEM 4-passenger vehicle

The benefits from expanding NEV use include, but are not limited to: energy savings (reduced gasoline consumption), improved air quality, cost savings, alternative mobility option, 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.

For many communities the automobile remains the dominant mode of travel, even though many car trips are less than one mile. NEVs provide a clean transportation option, particularly for short trips on low-speed and low-volume roads. NEVs can also provide an important mobility option for people who do not prefer, or are not able to walk, ride a bike, or drive a conventional automobile.

NEVs are ideally suited for local errands, such as trips to the store, to and from school, and to local financial and medical centers. The most common use for NEVs is for recreation such as golfing, club activities, visiting, dining, and trips to fitness centers.

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 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



Kurrent - American Electric Vehicle Company

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Appendix B: List of Documents with Summaries

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Document List

WRCOG 4-City Neighborhood Electric Vehicle (NEV) Project

Version 1.0
December 2009



Item	Classification	Geographic Extent	Document Title	Summary	Source	Date	File Name	File Path
1	Regulations	National	49 CFR Part 571 Federal Motor Vehicle Safety Standards; Low Speed Vehicles, Department of Transportation, National Highway Traffic Safety Administration	Amends definition of "low-speed vehicle" (LSV) to eliminate the exclusion of trucks, and to limit this class of vehicles to those vehicles with a Gross Vehicle Weight Rating (GVWR) of less than 1,134 kilograms (2,500 pounds). Rule became effective on October 3, 2005.	Federal Register, Vol. 70, No. 158	Aug-05	49CFR part 571 NHTSA 05-22116.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
2	Regulations	California - Southern	Assembly Bill No. 663, Neighborhood Electric Vehicle Plan, City of Palm Desert	Authorizes the City of Palm Desert to establish a neighborhood electric vehicle (NEV) transportation plan.	State of California	Apr-09	Palm Desert SB 663.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
3	Regulations	California - Southern	Assembly Bill No. 110, Chapter 334, Golf Cart Lanes / Transportation Plan, City of Palm Desert	Authorizes the City of Palm Desert to establish golf cart lanes or adopt a golf cart transportation plan in a specified plan area.	State of California	Aug-95	AB110.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
4	Regulations	California - Southern	Assembly Bill No. 956, Neighborhood Electric Vehicle Plan, Rancho Mission Viejo	Authorizes the County of Orange to establish a NEV transportation plan for RMV.	State of California	Feb-07	sb_956_bill_20070223_introduce d.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
5	Regulations	California - Southern	Assembly Bill No. 956, Chapter 442, Neighborhood Electric Vehicle Plan, Rancho Mission Viejo	Provides that no reimbursement is required by the state to the County of Orange for the RMV Planned Community NEV transportation plan.	State of California	Oct-07	sb_956_bill_20071010_chaptered. pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
6	Regulations	California - Northern	Assembly Bill No. 2353, Chapter 422, Neighborhood Electric Vehicle Plan, City of Lincoln and Rocklin	Authorizes the City of Lincoln and the City of Rocklin to establish a NEV transportation plan for the plan area in the city subject to the same review process established for a golf cart transportation plan.	State of California	Sep-04	AB2353.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
7	Regulations	California - Northern	Assembly Bill No. 29633, Chapter 199, Neighborhood Electric Vehicle Plan, City of Lincoln and Rocklin	Extends the NEV provisions termination date for reporting compliance of provisions set in AB 2353 to January 1, 2012.	State of California	Jul-08	ab_2963_bill_20080722_chaptere d.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
8	Regulations	California - Overall	Assembly Bill No. 118, Alternative Fuels and Vehicle Technologies: Funding Programs	Establishes the Alternative and Renewable Fuel and Vehicle Technology Program to fund the development and deployment of innovative technologies to transform California's fuel and vehicle types to help attain the state's climate change policies.	State of California	Oct-07	ab_118_bill_20071014_chaptered .pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
9	Regulations	California - Overall	Senate Bill 732, Strategic Growth Council	Establishes the Strategic Growth Council for coordination of member agencies and management and award of grants and loans to support the planning and development of sustainable communities.	California State Senate	Apr-07	SB 732 Overview-GC.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
10	Regulations	California - Overall	California Department of Motor Vehicles (DMV), Vehicle Code	Provides the definition of a low speed vehicle and restrictions and prohibitions of low speed vehicles.	California Department of Vehicles	2009	vc385_5.pdf, vc21253.pdf, vc21260.pdf, vc21266.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
11	Regulations	WRCOG	Ordinance No. 782 An Ordinance of the County of Riverside Establishing the Riverside County Golf Cart Transportation Plan	Ordinance establishes a golf cart transportation program within the County of Riverside.	County of Riverside	Dec-98	ORD782.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
12	Regulations	WRCOG	Resolution No. 99-010 Sun City Golf Cart Transportation Plan	Resolution establishes a golf cart transportation plan for the Sun City area.	County of Riverside	Dec-98	Sun City Menifee Golf Cart Plan.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations

13	Regulations	California - Southern	City of Palm Desert California Municipal Code, Chapter 10.76 Golf Carts	The City of Palm Desert municipal code addressing golf carts. Includes design and safety criteria, permitting, and law enforcement of the rules and regulations for golf carts.	City of Palm Desert		PalmDesertMunicipalCodeGolfCars.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
14	Regulations	Other	Proposed Regulations Amending the Motor Vehicle Safety Regulations (Low Speed Vehicles)	A summary of proposed NEV regulation amendments for Canada. Includes general arguments in favor of LSV's, only allowing LSV's in controlled environments, slow moving vehicle signage / decal, allowing small trucks as LSV's and restricting fuel as an onboard energy source (i.e., battery operated only).	Electric Mobility Canada	Dec-07	ProposedRegulationsforLSV.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Regulations
15	Guidelines & Methodologies	California - Overall	Meeting Minutes, California Traffic Control Devices Committee (CTCDC) Meeting on City of Lincoln NEV Signage	Minutes from the CTCDC meeting approving the experimentation with the signage package with the change of "NEV Lane" to "NEV Route" with use of existing striping details.	California Traffic Control Devices Committee (CTCDC)	Jul-05	CTCDC Minutes - pgs 1-15-16 - 072805.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
16	Guidelines & Methodologies	California - Overall	CTCDC Approved Experimental Standards	CTCDC approved experimental standards for NEV route sign, NEV/bike lane sign, and NEV pavement markings for the City of Lincoln.	City of Lincoln	Nov-05	CTCDC Approved Exp Stds.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
17	Guidelines & Methodologies	California - Overall	A Report to the California State Legislature, City of Lincoln Neighborhood Electric Vehicle Transportation Plan Evaluation	Per the provisions in AB 2353, the City of Lincoln's NEV plan evaluation report. Summarizes plan's effectiveness, data collection, analysis and results, findings and recommendations, and future work and refinements.	City of Lincoln	Jan-08	Lincoln NEV Transportation Plan Evaluation.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
18	Guidelines & Methodologies	California - Other	City of Rocklin Final Draft NEV Transportation Plan, Resolution No. 2008-39	The City of Rocklin's NEV transportation plan. Includes project overview, opportunities and constraints, energy and cost considerations, air quality benefits, community considerations, and the NEV transportation plan.	City of Rocklin, Public Works Department	Feb-08	2008-39 reso Adopt NEVTP FINAL 02_26_08.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
19	Guidelines & Methodologies	California - Other	City of Lincoln NEV Transportation Plan	The City of Lincoln's NEV transportation plan. Includes project overview, opportunities and constraints, energy and cost considerations, air quality benefits, community considerations, and the NEV transportation plan.	City of Lincoln	Aug-06	Final NEV Transportation Plan.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
20	Guidelines & Methodologies	California - Other	Roadway Infrastructure for Neighborhood Electric Vehicles	Design guides for a NEV infrastructure.	The University of California Transportation Center University of California Berkeley	1994	UC Berkley-Roadway Infrastructure for NEVs.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
21	Guidelines & Methodologies	National	AASHTO Guide for the Development of Bicycle Facilities	A guide on the development of facilities for safe bicycle travel. Presents sound guidelines to help fulfill the needs of both bicyclists and other highway users.	AASHTO	Jun-05	aashto.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
22	Guidelines & Methodologies	California - Overall	Caltrans Highway Design Manual Chapter 1000 Bikeway Planning and Design	Caltrans planning and design policies for bikeways.	Caltrans	Jun-06	chp1000.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
23	Guidelines & Methodologies	California - Overall	California Manual on Uniform Traffic Control Devices for Streets and Highways Part 9 Traffic Controls for Bicycle Facilities	FHWA's MUTCD 2003 Revision 1 November 2004, Revision 2 December 2007	State of California Business, Transportation and Housing Agency Department of Transportation	Dec-07	CAMUTCD-Part9.pdf	U:\UcJobs_06600-07000\07000\07007\Task 2 Document and Data Search\DocList\Guidelines Methodologies

24	Guidelines & Methodologies	California - Southern	Palm Desert Golf Cart Routes Brochure	Map of the golf cart routes in the City of Palm Desert.	City of Palm Desert		PalmDesertGolfCartRoutes.pdf	U:\UcJobs_06600-07000\07000\07007\Task 2 Document and Data Search\DocList\Guidelines Methodologies
25	Guidelines & Methodologies	California - Southern	Palm Desert General Plan Golf Cart and Bike Path Routes	Map of the planned golf cart and bike path routes in the City of Palm Desert.	City of Palm Desert		PalmDesertGeneralPlanGolfBikeRoutes.pdf	U:\UcJobs_06600-07000\07000\07007\Task 2 Document and Data Search\DocList\Guidelines Methodologies
26	Guidelines & Methodologies	California - Southern	Master Trails Exhibit, RMV - Planning Area 1	Map of the planned master trails for Phase 1 of the Ranch Plan Community. Includes NEV and shared NEV bikeway trails.	EDAW	Oct-06	RMVMasterTrailsPlan.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Guidelines and Methodologies
27	Studies and Articles	California - Overall	Studies of Road Infrastructure Requirements for Small Innovative Vehicles	Discusses the benefits and costs associated with the use of NEVs / LSVs. Identifies ways the vehicles might be introduced and the road modifications that would be required and desired for supporting vehicle use.	California PATH Program, Institute of Transportation Studies, University of California, Berkeley	Nov-93	Garrison-Studies of Road Infrastructure-1993.pdf	U:\UcJobs_06600-07000\07000\07007\Task 2 Document and Data Search\DocList\Guidelines Methodologies
28	Studies and Articles	California - Overall	Study of NEV User Behavior	Report summarizing the results of a survey conducted on travel behavior and mobility preferences of NEV owners in California. Includes statistical findings, analysis, and survey instrument.	Green Car Institute	Jul-03	Kurani et al-Study of NEV user Behavior in CA-GCI-2003.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
29	Studies and Articles	California - Overall	Demonstration of Neighborhood Electric Vehicles (NEVs)	Presents an overview and findings from four host sites where NEVs were demonstrated in various capacities (e.g., shuttling airport maintenance works and transporting community members on errands). Includes the project background, initiation and logistics, qualitative/customer acceptance data, quantitative data, conclusions and lessons learned.	California Energy Commission	Jul-02	Little-Demo of NEVs CEC 2002.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
30	Studies and Articles	National	The Mobility Needs of Older Americans: Implications for Transportation Reauthorization	Discusses the growing use of small electric vehicles among the elderly.	The Brookings Institute, Center of Urban and Metropolitan Policy	Jul-03	Rosenbloom-Mobility Needs of Older Americans-2003.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Misc
31	Studies and Articles	Other	Assessment of Low-Speed Electric Vehicles in Urban Communities	Report summarizing the results of LSV integration into urban traffic, specifically safety and reliability, for a 12-week period.	Transportation Development Centre Transport Canada	Apr-02	Lamy-Assessment of Low speed EVs-2002.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
32	Studies and Articles	Other	A Critical Evaluation of Electric Vehicle Benefits	A paper investigating the benefits and costs of NEVs. Discusses the types of electric vehicles, travel impacts, costs, accidents, reduction in air and noise pollution, and recommendations.	Transportation Development Centre Transport Canada	Nov-99	Litman-A Critical Eval of EV Benefits - VTPI study 1999.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
33	Studies and Articles	California - Other	Thriving with Neighborhood Electric Vehicles	Paper on the implementation of a NEV transportation plan at the City of Lincoln. Discusses legality, legislation, benefits, design elements, funding, and implementation of the plan.	American Society of Civil Engineers (ASCE)	Jul-07	Paper-Thriving with NEVs-060908.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
34	Studies and Articles	California - Other	"Small vehicles, big rewards"	Article on the City of Rocklin's NEV transportation plan implementation and the benefits of NEVs.	PlacerHerald.com	Feb-08	Article-Placer Herald-020108.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
35	Studies and Articles	California - Other	"Jackson City Council supports electric vehicles"	Article summarizing the city council meeting supporting electric vehicles at the City of Jackson, CA.	Ledger-Dispatch.com	Dec-07	Jackson City-121207.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
36	Studies and Articles	California - Other	"Woodland to Davis via bike road?"	Article discusses a path between Davis and Woodland that would be a dedicated route for bikes and electric vehicles.	The Sacramento Bee Metro	Dec-07	SacBee-121107.tif	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
37	Studies and Articles	California - Other	"Lincoln Police going Green"	Article on the City of Lincoln's implementation of NEVs for part of its Police Department vehicle fleet.	LincolnNewsMessenger.com	Jul-07	LincolnNewsMessenger Articles.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles

38	Studies and Articles	California - Other	"CA City's NEV Plan Receives Increased Attention Within the U.S. and Overseas"	Article on the City of Lincoln's NEV transportation plan implementation.	The Urban Transportation Monitor, Vol. 22, No. 13	Jul-08	UTM NEV article-071108.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
39	Studies and Articles	Other	NEV Operating Costs Study (Electricity)	Presents NEV use and cost analysis, including comparison with a gas vehicle.	Paul Ternullo		NEVOperatingCostStudy.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
40	Studies and Articles	Other	Prospects for Neighborhood Electric Vehicles	Article on the challenges, benefits, infrastructure changes, safety, liability, traffic control, and marketing of NEVs.	Transportation Research Record 1444		ProspectsforNEV.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
41	Studies and Articles	National	Neighborhood Electric Vehicles, OLR Research Report, 2008-R-0479	Report on NEVs (definition, permitted use, legislation, and advantages and disadvantages) for the Connecticut General Assembly.	Connecticut General Assembly, Office of Legislative Research	Sep-08	NeighborhoodElectricVehiclesOLR ResearchReport.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
42	Studies and Articles	California - Overall	Household Markets for Neighborhood Electric Vehicles	NEV market study. Includes case studies of Palm Desert and Sun City, NEV trail results, and statewide survey.	Institute of Transportation Studies, University of California, Davis	May-95		U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Studies and Articles
43	Transit	SCAG - Overall	Metrolink Map	Map of Metrolink stations in Southern California.	Metrolink Website	Sep-07	MetrolinkMap.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Transit
44	Transit	WRCOG - Overall	RTA System Map	Map of Riverside Transit Agency System with trolley routes.	Riverside Transit Agency Website	Jun-09	RTA_SystemMap_v1.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Transit
45	TUMF	WRCOG - Overall	The 2009 TUMF Transportation Improvement Program Projects	Map representing the adopted (February 2009) transportation improvement program (TIP) projects.	WRCOG	Feb-09	WRCOG TUMF Network 2009.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\TUMF
46	TUMF	WRCOG - Overall	The 2009 WRCOG TUMF RTA TIP Approved Transit Center	Map representing the approved (February 2009) RTA transit centers in each TUMF zone.	WRCOG	Feb-09	WRCOG TUMF RTA Transit Centers.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\TUMF
47	Transportation	Corona	City of Corona Traffic Control Master Plan Map	Map of the speed limits and traffic controls (e.g., signals, four-way stops, crosswalks) for the City of Corona.	City of Corona Website	Apr-09	2009-04-27_TrafficMap.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Corona
48	Transportation	Corona	Existing and Proposed Bike Trails Map, Corona General Plan Update	Map of existing and proposed bike trails (Class I, Class II, and Class III) in the City of Corona. Includes existing and proposed bike parking and existing bike amenities.	City of Corona Website	Nov-03	Existing&ProposedBikeTrails.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Corona
49	Transportation	Corona	City of Corona General Plan Circulation Map	Map of the general plan circulation element for the City of Corona.	City of Corona Website	Oct-07	GIS_cirmapsm.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Corona
50	Land Use	Corona	City of Corona General Plan Map	Map of the general plan land use for the City of Corona.	City of Corona Website	Mar-07	GIS_gpmap17.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Corona
51	Zoning	Corona	City of Corona Major Zoning Categories and Specific Plans Map	Map of specific plans and major zoning categories for the City of Corona.	City of Corona Website	Feb-08	GIS_zonesm.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Corona
52	Transportation	Moreno Valley	City of Moreno Valley Master Plan of Trails	Map of the master plan of trails for the City of Moreno Valley.	City of Moreno Valley Website	Jul-07	masterplan-trailsmap0707.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
53	Transportation	Moreno Valley	City of Moreno Valley Existing Bikeways Map	Map of existing Class I, Class II, and Class III bikeways with bike logic signal locations in the City of Moreno Valley.	City of Moreno Valley Website	Aug-08	existing_bikeways0808.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
54	Transportation	Moreno Valley	City of Moreno Valley Circulation Plan	Map of the circulation element for the City of Moreno Valley.	City of Moreno Valley Website	Jan-06	circ_plan_fig91.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
55	Transportation	Moreno Valley	City of Moreno Valley Citywide Speed Limit	Map of the speed limits for the City of Moreno Valley.	City of Moreno Valley Website	Aug-09	speedzone-map1109.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
56	Transportation	Moreno Valley	City of Moreno Valley 2009 Traffic Counts	Map of 2009 traffic counts for the City of Moreno Valley.	City of Moreno Valley Website	Feb-09	VolumeCensus-2009.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley

57	Transportation	Moreno Valley	Traffic Signal Design and Signing/Striping Design Checklist for Plan Checks	Design criteria for traffic signal plans for the City of Moreno Valley.	City of Moreno Valley Website		TrafficSignalDesign.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
58	Transportation	Moreno Valley	City of Moreno Valley Designated Truck Route Map	Map of the designated truck routes for the City of Moreno Valley.	City of Moreno Valley Website	Sep-09	truckroutes-0909.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Moreno Valley
59	Transportation	Norco	City of Norco Speed Limits	Map of the speed limits for the City of Norco.	City of Norco, Department of Planning	2007	Speed Limit 2007.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Norco
60	Transportation	Norco	City of Norco General Plan Land Use Map	Map of the general plan land use for the City of Norco.	City of Norco Website	May-07	blobdload.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Norco
61	Transportation	Riverside	Riverside General Plan 2025, Circulation and Community Mobility Element	The circulation element chapter from the City of Riverside's General Plan. Outlines the City's transportation network and community mobility plans.	City of Riverside Website	Nov-07	05_Circulation_and_Community_Mobility_Element.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
62	Transportation	Riverside	Master Plan of Trails and Bikeways Map	Map of existing and planned trails and bikeways in the City of Riverside. Extract from the City of Riverside General Plan.	City of Riverside Website	Dec-06	Master Plan of Trails and Bikeways.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
63	Transportation	Riverside	City of Riverside Bicycle Master Plan	The Bicycle Master Plan Update enhances and expands the City of Riverside's existing bikeway network. The plan presents the goals, objectives, and policies of the bicycle master plan, existing conditions, needs analysis, recommended bikeway improvements, and implementation strategy. The plan was prepared by Alta Planning + Design.	City of Riverside Website	May-07	Bicycle_Master_Plan.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
64	Transportation	Riverside	Existing and Proposed Bikeways .pdf	Map of existing and proposed bikeways in the City of Riverside. Extract from the City of Riverside Bicycle Master Plan.	City of Riverside Website	Dec-06	Existing and Proposed Bikeways .pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
65	Transportation	Riverside	Chapter 10.76.010 Speed Limits	List of streets and speed limits for the City of Riverside.	City of Riverside Website		Speed-Limits.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
66	Transportation	County of Riverside	24 Hour Volume Counts	List of streets and 24 hour volume counts for the City of Riverside.	City of Riverside Website		Traffic-Volume-Count.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\Riverside
67	Transportation	County of Riverside	Trails and Bikeway System, Eastvale Area Plan Map	Map of existing and proposed trails and bikeways in the Eastvale unincorporated area.	County of Riverside TLMA Website		eastvale.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside
68	Transportation	County of Riverside	Trails and Bikeway System, Jurupa Area Plan Map	Map of existing and proposed trails and bikeways in the Jurupa unincorporated area.	County of Riverside TLMA Website		jurupa.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside
69	Transportation	County of Riverside	Trails and Bikeway System, Lake Matthews and Woodcrest Area Plan Map	Map of existing and proposed trails and bikeways in the Lake Matthew and Woodcrest unincorporated area.	County of Riverside TLMA Website		lakemathews_woodcrest.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside
70	Transportation	County of Riverside	Trails and Bikeway System, Temescal Canyon Area Plan Map	Map of existing and proposed trails and bikeways in the Temescal Canyon unincorporated area.	County of Riverside TLMA Website		temescalcanyon.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside
71	Transportation	WRCOG - Central	Trails and Bikeway System, Lakeview/Nuevo Area Plan Map	Map of existing and proposed trails and bikeways in the Highgrove unincorporated area.	County of Riverside TLMA Website		highgrove.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside
72	Transportation	WRCOG - Central	Trails and Bikeway System, Reche Canyon/Badlands Area Plan Map	Map of existing and proposed trails and bikeways in the Reche Canyon and Badlands unincorporated area.	County of Riverside TLMA Website		rehecanyon_badlands.pdf	U:\UcJobs_06600-07000\07000\07042\Task 2 Data Gathering\Doc List\County of Riverside

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Appendix C: Stakeholder Survey

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WRCOG 4-CITY NEIGHBORHOOD ELECTRIC VEHICLE (NEV) PLAN COMMUNITY SURVEY

This short survey is intended to provide potential respondents with information regarding a specialized transportation mode and gather data to aid in the development of a meaningful transportation plan. All responses are confidential.

Neighborhood Electric Vehicles (NEVs) are street legal, zero-emission vehicles with top speeds of approximately 25 miles per hour. NEVs are often compared to golf carts but have safety features and performance benefits that rival their recreational counterparts.

For statistical purposes, please provide your zip code: _____

Tell us about your experience with NEVs (select from one or more of the choices below):

- I am not familiar with NEVs
- I am aware of the differences between NEVs and golf carts
- I have an NEV
- I have a golf cart
- I have seen NEVs used in public places (streets, shopping, school, etc.)
- I have seen golf carts used in public places other than a golf course or off road venue

Use of an NEV is legally restricted to streets with a posted speed limit of 35 miles per hour or less unless there is a special lane designated for its use (similar to a bike lane). Drivers must have a valid driver's license. NEV trips do not typically exceed 5-7 miles due to battery range and relatively low travel speed.

How would you describe your typical vehicle trips during an average week? (Select from one or more of the choices below):

- I drive primarily on freeways
- I drive primarily on streets
- I use transit (bus, train, shuttle and/or taxi)
- I ride a bike (for work, recreational and/or school)
- I carpool and am rarely the driver
- I use a car, van, truck or motorcycle for most of my transportation needs

How far do you travel for the following trips? (Select the best answer for each trip type):

- Work
 - Less than 2 miles
 - 2-4 miles
 - 5-7 miles
 - 8 or more miles
- School
 - Less than 2 miles
 - 2-4 miles
 - 5-7 miles

WRCOG 4-City NEV Transportation Plan

- 8 or more miles
- Shopping
 - Less than 2 miles
 - 2-4 miles
 - 5-7 miles
 - 8 or more miles
- Social (church, visiting friends, etc.)
 - Less than 2 miles
 - 2-4 miles
 - 5-7 miles
 - 8 or more miles
- Recreation
 - Less than 2 miles
 - 2-4 miles
 - 5-7 miles
 - 8 or more miles

What factors might prevent you from considering an NEV as a transportation choice for shorter trips? (Select all that apply):

- Cost of vehicle (\$7,000 – 12,000+)
- Cost of electricity for charging vehicle
- Safety (driving near larger vehicles)
- Lack of special NEV lanes near your home
- Trip distance too long for NEV to be convenient
- Have not formed an opinion

What factors do you find most appealing that might lead to your use of an NEV in the future? (Select all that apply)

- Some of my trips are relatively short
- NEVs look fun to drive
- Relatively low operating cost
- Environmentally friendly (zero emissions)
- Trips between my home and destination are on streets with low speed limits

When designing a network of NEV routes using existing low speed streets combined with NEV-only lanes on higher speed roads, several factors should be considered. Please rank the following characteristics in order of importance with 1 being the most important and 8 being the least important:

- Preferential parking spaces at the destination (NEVs are narrower and shorter than most vehicles. Designated NEV parking spaces usually have an electrical outlet nearby for recharging purposes but spaces may not necessarily be in “best spots”.)
- Safety (Restrict to lower speed roads to avoid potential conflicts with faster moving vehicles. NEVs are relatively new and are not yet in wide operation. However, in communities where NEVs are common, accident rates do not appear out of the ordinary.)
- Education and signage for NEV and non-NEV users (Signs like “share the road” or pavement striping can help raise awareness and reduce vehicle conflicts.)
- Routes should link to transit centers such as Metrolink, bus depots, and park and ride lots

- Routes should link to shopping centers, parks, and schools
- Routes should link to large employment centers like downtown areas, commercial centers or warehouse/industrial parks
- Recharging stations should be readily available in case we forgot to charge at home
- Safety (Have routes that include higher traffic/speed streets with dedicated lanes as well as low speed streets for maximum travel options.)

Please provide your suggestions regarding other factors that you feel should be considered in the development of an NEV route:

[Text box for response]

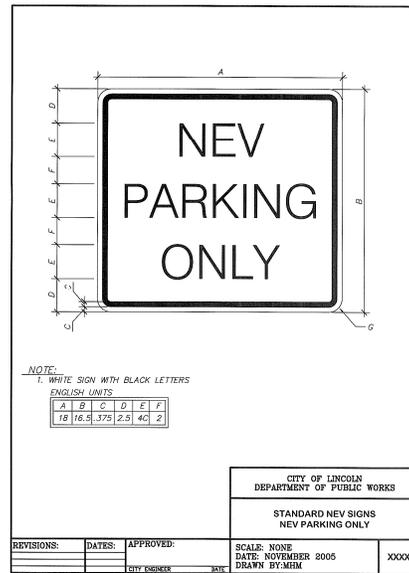
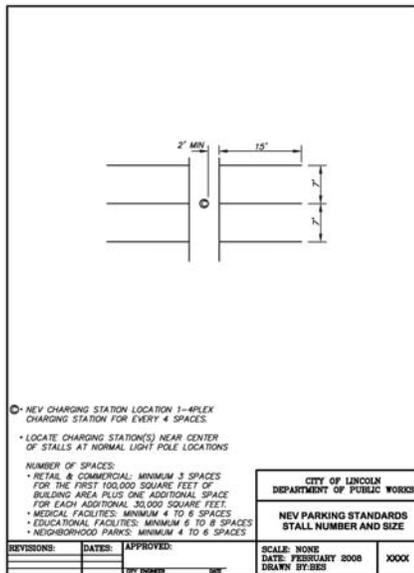
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Appendix D: EXAMPLE NEV Parking and Charging Station Standards

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Appendix D: EXAMPLE NEV Parking and Charging Station Standards

- NEV parking space: 15 feet long by 7 feet wide.
- Quantity of spaces for a typical Retail/Commercial center: minimum 3 spaces for the first 10,000 square foot of building area, plus one additional space per each 6,000 square feet.
- Medical facilities: 4 to 6 spaces minimum
- Educational facilities: 6 to 8 spaces minimum
- Neighborhood parks: 4 to 6 spaces minimum



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Appendix E: Draft NEV Legislation for the 4-City NEV Transportation Plan

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Introduced by _____**Date:** _____

An act to add Chapter 8 (commencing with Section 1965) to Division 2.5 of the Streets and Highways Code, and to amend Sections 21251 and 21260 of the Vehicle Code, relating to neighborhood electric vehicles.

LEGISLATIVE COUNSEL'S DIGEST

[AB/SB] _____, as introduced, _____. Neighborhood electric vehicles.

Existing law defines "low-speed vehicle" for purposes of the Vehicle Code as a motor vehicle, other than a motor truck, with 4 wheels that is capable of a minimum speed of 20 miles per hour and a maximum speed of 25 miles per hour on a paved level surface and that has a gross vehicle weight rating of less than 3,000. Existing law imposes certain restrictions on the use of low-speed vehicles on public streets and highways, and generally requires an operator of a low-speed vehicle to have a driver's license. A violation of the Vehicle Code is an infraction, unless otherwise specified.

Existing law authorizes a city or county to establish a golf cart transportation plan subject to the review of the appropriate transportation planning agency and traffic law enforcement agency. Existing law provides that operating a golf cart other than on an authorized roadway is an infraction punishable by a fine not exceeding \$100. Existing law authorizes the City of Lincoln and the City of Rocklin in the County of Placer to establish a neighborhood electric vehicle transportation plan subject to the same review process established for a golf cart transportation plan, and defines "neighborhood electric vehicle" for these purposes to have the same meaning as the above definition of low-speed vehicle. A person operating a neighborhood electric vehicle in the plan area in violation of certain provisions is guilty of an infraction punishable by a fine not exceeding \$100.

This bill would enact similar provisions authorizing the City/Cities of _____ in the County of _____ to establish a neighborhood electric vehicle transportation plan for the _____ in that county, subject to similar penalties. Because the bill would create a new crime, it would impose a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority.

Appropriation: no.

Fiscal committee: yes.

State-mandated local program: yes.

The people of the State of California do enact as follows:

SECTION 1. Chapter 8 (commencing with Section 1965) is added to Division 2.5 of the Streets and Highways Code, to read:

CHAPTER 8. NEIGHBORHOOD ELECTRIC VEHICLE
TRANSPORTATION PLAN FOR _____
IN _____ COUNTY

1965. It is the intent of the Legislature, in enacting this chapter, to authorize the Cities/City of _____ in the County of _____ to establish a neighborhood electric vehicle (NEV) transportation plan for the _____ in the county. The purpose of this NEV transportation plan is to further the community’s vision of creating a sustainable development that reduces gasoline demand and vehicle emissions by offering a cleaner, more economical means of local transportation within the plan area. It is the further intent of the Legislature that this NEV transportation plan be designed and developed to best serve the functional travel needs of the plan area, to have the physical safety of the NEV driver’s person and property as a major planning component, and to have the capacity to accommodate NEV drivers of every legal age and range of skills.

1965.1. The following definitions apply to this chapter:

(a) “Plan area” means the _____ project area and all streets located within the project area.

(b) “Neighborhood electric vehicle” or “NEV” means a low-speed vehicle as defined by Section 385.5 of the Vehicle Code.

(c) “NEV lanes” means all publicly owned facilities that provide for NEV travel including roadways designated by signs or permanent markings which are shared with pedestrians, bicyclists, and other motorists in the plan area.

(d) “_____” means the comprehensive land use, conservation, and development program initially approved by the _____ County Board of Supervisors on (date) .

(e) “Speed-modified golf cart” means a golf cart that is modified to meet the safety requirements of Section 517.500 of Title 49 of the Code of

1 Federal Regulations. (f) "Transportation planning agency" means the
2 _____.
3 1965.2.

4 (a) The Cities/City of _____ may, by ordinance or resolution,
5 adopt a NEV transportation plan for the _____.

6 (b) The transportation plan shall have received a prior review and the
7 comments of the transportation planning agency and any agency having
8 traffic law enforcement responsibilities in the Cities/City of
9 _____.

10 (c) The transportation plan may include the use of a state highway, or
11 any crossing of the highway, subject to the approval of the Department of
12 Transportation.

13 1965.3. The transportation plan shall include, but is not limited to, all
14 of the following elements:

15 (a) Route selection, which includes a finding that the route will
16 accommodate NEVs without an adverse impact upon traffic safety, and
17 will consider, among other things, the travel needs of commuters and other
18 users.

19 (b) Transportation interfacing, which shall include, but not be limited
20 to, coordination with other modes of transportation so that a NEV driver
21 may employ multiple modes of transportation in reaching a destination in
22 the plan area.

23 (c) Provision for NEV related facilities including, but not limited to,
24 special access points and NEV crossings.

25 (d) Provisions for parking facilities, including, but not limited to,
26 community commercial centers, golf courses, public areas, parks, and
27 other destination locations.

28 (e) Provisions for special paving, road markings, signage and striping
29 for NEV travel lanes, road crossings, parking, and circulation.

30 (f) Provisions for NEV electrical charging stations.

31 (g) NEV lanes for the purposes of the transportation plan shall be
32 classified as follows:

33 (1) Class I NEV routes provide for a completely separate right-of-way
34 for the use of NEVs.

35 (2) Class II NEV routes provide for a separate striped lane adjacent to
36 roadways with speed limits of 55 miles per hour or less.

37 (3) Class III NEV routes provide for shared use by NEVs with
38 conventional vehicle traffic on streets with a posted speed limit of 35
39 miles per hour or less.

40 1965.4. If the Cities/City of _____ adopts a NEV transportation
41 plan for _____, it shall do both of the following:

42 (a) Establish minimum general design criteria for the development,
43 planning, and construction of separated NEV lanes, including, but not
44 limited to, the design speed of the facility, the space requirements of the
45 NEV, and roadway design criteria.

1 (b) In cooperation with the department, establish uniform
2 specifications and symbols for signs, markers, and traffic control devices
3 to control NEV traffic; to warn of dangerous conditions, obstacles, or
4 hazards; to designate the right-of-way as between NEVs, other vehicles,
5 and bicycles; to state the nature and destination of the NEV lane; and to
6 warn pedestrians, bicyclists, and motorists of the presence of NEV traffic.

7 1965.5. If the Cities/City of _____ adopts a NEV
8 transportation plan for _____, it shall also adopt all of the
9 following as part of the plan:

10 (a) NEVs eligible to use NEV lanes shall meet the safety requirements
11 for low-speed vehicles as set forth in Section 571.500 of Title 49 of the
12 Code of Federal Regulations.

13 (b) A permit process for golf carts that requires speed-modified golf
14 carts to meet minimum design criteria adopted pursuant to subdivision (a).
15 The permit process may include, but not be limited to, permit posting,
16 permit renewal, operator education, and other related matters.

17 (c) Minimum safety criteria for NEV operators, including, but not
18 limited to, requirements relating to NEV maintenance and NEV safety.
19 Operators shall be required to possess a valid California driver's license
20 and to comply with the financial responsibility requirements established
21 pursuant to Chapter 1 (commencing with Section 16000) of Division 7 of
22 the Vehicle Code.

23 (d) (1) Restrictions limiting the operation of NEVs to separated NEV
24 lanes on those roadways identified in the transportation plan, and allowing
25 only those NEVs and speed-modified golf carts that meet the safety
26 equipment requirements specified in the plan to be operated on separated
27 NEV lanes of approved roadways in the plan area.

28 (2) Any person operating a NEV in the plan area in violation of this
29 subdivision is guilty of an infraction punishable by a fine not exceeding
30 one hundred dollars (\$100).

31 SEC. 2. Section 21251 of the Vehicle Code is amended to read:

32 21251. Except as provided in *Chapter 7 (commencing with Section*
33 *1963) and Chapter 8 (commencing with Section 1965) of Division 2* of the
34 *Streets and Highways Code*, and Sections 4023, 21115, and 21115.1, a
35 low-speed vehicle is subject to all the provisions applicable to a motor
36 vehicle, and the driver of a low-speed vehicle is subject to all the
37 provisions applicable to the driver of a motor vehicle or other vehicle,
38 when applicable, by this code or any other code, with the exception of
39 those provisions which, by their very nature, can have no application.

40 SEC. 3. Section 21260 of the Vehicle Code is amended to read:

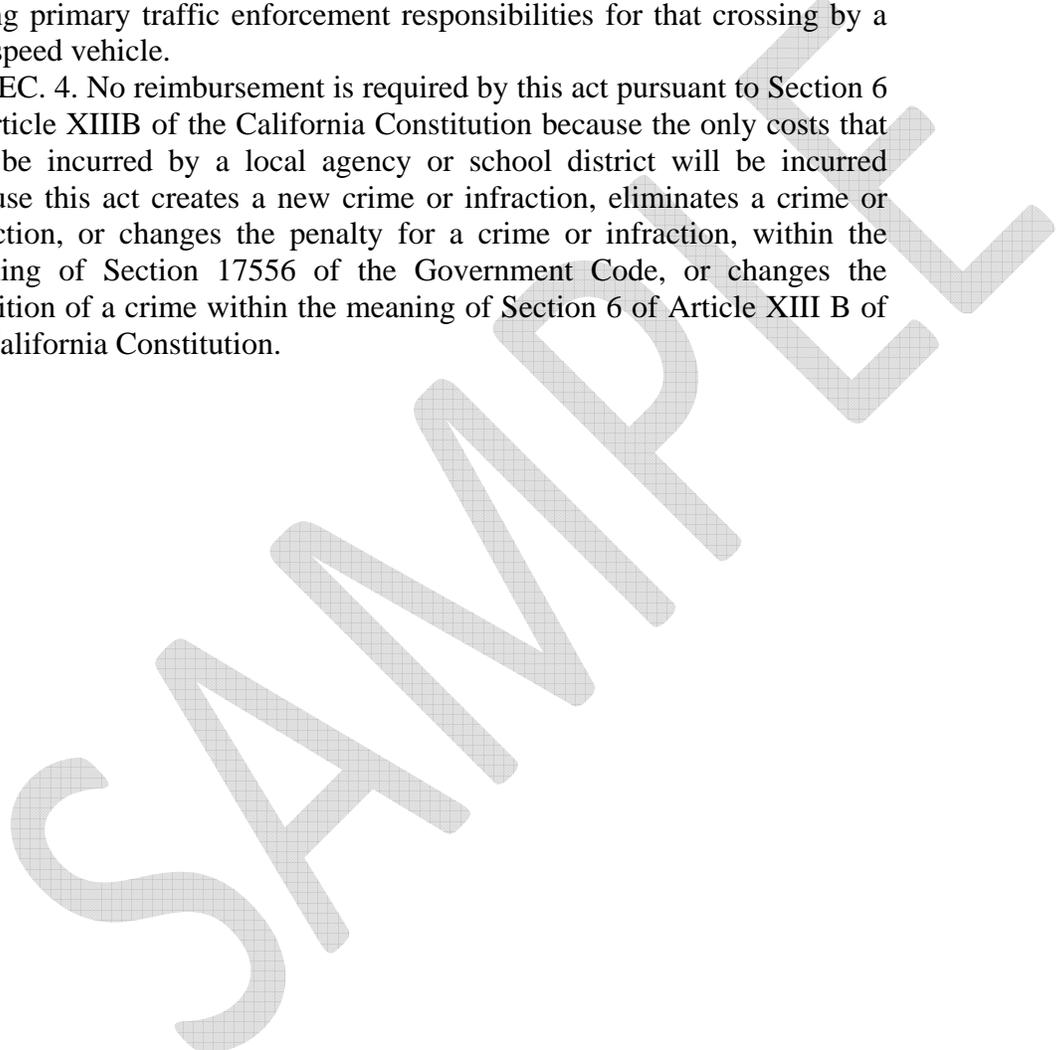
41 21260. (a) Except as provided in paragraph (1) of subdivision (b), or in
42 an area where a neighborhood electric vehicle transportation plan has been
43 adopted pursuant to Chapter 7 (commencing with Section 1963) or
44 Chapter 8 (commencing with Section 1965) of Division 2.5 of the Streets
45 and Highways Code, the operator of a low-speed vehicle shall not operate

1 the vehicle on any roadway with a speed limit in excess of 35 miles per
2 hour.

3 (b) (1) The operator of a low-speed vehicle may cross a roadway with
4 a speed limit in excess of 35 miles per hour if the crossing begins and ends
5 on a roadway with a speed limit of 35 miles per hour or less and occurs at
6 an intersection of approximately 90 degrees.

7 (2) Notwithstanding paragraph (1), the operator of a low-speed vehicle
8 shall not traverse an uncontrolled intersection with any state highway
9 unless that intersection has been approved and authorized by the agency
10 having primary traffic enforcement responsibilities for that crossing by a
11 low-speed vehicle.

12 SEC. 4. No reimbursement is required by this act pursuant to Section 6
13 of Article XIIB of the California Constitution because the only costs that
14 may be incurred by a local agency or school district will be incurred
15 because this act creates a new crime or infraction, eliminates a crime or
16 infraction, or changes the penalty for a crime or infraction, within the
17 meaning of Section 17556 of the Government Code, or changes the
18 definition of a crime within the meaning of Section 6 of Article XIII B of
19 the California Constitution.



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