Four Lane Arterial with Class II NEV/Bike Lanes

City of Lincoln
John E. Pedri, P.E.,
Director of Public Works

Carl Walker, P.E.,
Senior Engineer

640 Fifth Street
Lincoln, CA 95648
(916) 645-8576

Sage Community Group
Annie R. Embree, Esq.,
SCG,
Legal Consultant
(530) 885-5123

MHM Engineers & Surveyors
Leo Rubio, P.E.,
Project Engineer

Steven Ainsworth, P.E.,
Project Manager

Robert O. Watkins, P.E.,
Principal Investigator

1082 Sunrise Avenue, Suite 100
Roseville, CA 95661
(916) 783-4100

Autumn Wind
Greg Gilbert,
Air Quality
(916) 663-6353

Fehr & Peers
Rich Ledbetter,
Transportation/Planning
(916) 773-1900
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Chapter I - Project Overview

Program Description
The City of Lincoln has requested city-wide NEV routes that would "enable any resident to travel from their home to Downtown Lincoln" reports Councilmember Tom Cosgrove.

The City of Lincoln NEV project is an effort to accommodate the City's changing urban lifestyle by encouraging the use of Neighborhood Electric Vehicles, or NEVs for short. This effort will result in air quality improvements, community cohesion, energy savings, reduced travel costs, increased mobility, independence for aging drivers, and greater use of public transit. NEVs are small, electric powered personal vehicles. They have a limited range and can travel up to speeds of 25 mph. They are an ideal transportation alternative for short, (up to 30 miles) local trips. While they may look like a golf-cart to the casual observer, they are actually a motor vehicle requiring a driver’s license, registration, and insurance. NEVs such as the Chrysler GEM are specifically designed to meet federal safety standards for low-speed vehicles as defined in Section 571.500, Title 49 Code of Federal Regulations.

NEVs are a desirable new form of transportation for many reasons:

- NEVs have a great safety record.
- NEVs are zero emission electric vehicles.
- NEVs improve air quality.
- The energy consumption of an NEV is less than 1/5 that of a conventional automobile.
- NEVs provide freedom and continued mobility for aging or impaired drivers.
- NEVs are affordable.
- NEVs support the local economy by encouraging residents to shop locally.
- NEVs encourage use of existing public transportation.

California's first major citywide NEV transportation project is well underway in the City of Lincoln. Lincoln plans relatively minor modifications to accommodate NEVs. The city will implement signing and striping improvements, create special parking spaces, and build an NEV crossing at the Auburn Ravine, a stream that divides this fast-growing city. Businesses have already begun to accommodate and encourage NEV transportation by providing special parking for their NEV customers.

The City of Lincoln is in a very favorable position to accommodate the beneficial use of NEVs. NEVs are already circulating in the Sun City Lincoln Hills development and special parking areas are provided in the adjacent Safeway and Raley’s shopping center. The City believes that with the advent of a comprehensive NEV circulation system, the number of NEVs users will dramatically increase.

To accommodate use of NEVs, the City of Lincoln must become “NEV Ready”. An NEV ready city can be defined as having the necessary infrastructure, including charging facilities, striping, signage, parking, and education to safely accommodate NEV travel. The City intends to implement these changes in stages. This plan will allow limited NEV use in the near future, culminating in a comprehensive NEV travel plan throughout the City.
In accordance with Assembly Bill (AB 2353), the City of Lincoln plan envisions three levels of NEV routes:

Class I NEV Route:
Class I NEV routes provide a completely separate right-of-way for the exclusive use of NEVs, pedestrians and bikes with cross-flow minimized. The minimum paved width for a Class I NEV route is 14-feet (for two way travel) with a minimum 2-foot wide graded area provided adjacent to the pavement. The proposed bridge over Auburn Ravine connecting Sun City Lincoln Hills area to E Street is an example of a Class I NEV route. It is the intent to design all Class I NEV routes to allow combined NEV/bicycle use.

Class II NEV Route:
Class II NEV routes are designated as a separate striped lane adjacent to traffic. There is one striped lane for each travel direction. The desirable minimum width for a Class II NEV route is 7-feet. Del Webb Blvd. is an example of a Class II NEV lane. It is the intent to design all Class II NEV routes to allow combined NEV/bicycle use.

Class III NEV Route:
Class III NEV routes provide for shared use with automobile traffic on streets with a posted speed limit of 35 mph or less. All residential streets within Sun City Lincoln Hills are Class III NEV routes. The City will provide signage to direct NEVs to preferred streets. Some streets within the City that are posted 35 mph may be designated as not appropriate for NEV use.

(NEV Route plans are shown in Appendix A.)

B. Impact and Benefits
1. General
   Many other entities in the region will benefit from the City of Lincoln’s experience in implementing an NEV transportation plan. When the plan is complete, the process will be made available to other entities to help facilitate their own NEV transportation plan. Here are a few of the benefits of the Lincoln NEV Project:
   
   - The emergence of an NEV friendly Lincoln has allowed home builders in Lincoln to customize new development to accommodate NEVs.
   - Lincoln plans to include NEV routes in their General Plan update.
   - NEV routes can double as bicycle routes with proper design, thus the miles of bike trails will increase within the City.
   - Accommodating NEVs is more effective and less costly than dial-a-ride programs for unmet transit needs.
   - Air Quality improvements result from the use of small electric motors that emit no pollutants in the local atmosphere. Over half of the otherwise short cold-start automobile trips in cities the size of Lincoln are within the range of NEVs.
   - NEVs can achieve the energy equivalent of over 150 mpg for a standard gasoline powered vehicle.
   - NEV use provides for a more cohesive community due to their limited travel range.
   - NEV travel encourages residents to support their local businesses.
   - NEVs provide mobility for people who cannot drive an automobile, including aging drivers.
   - NEVs are affordable and can reduce personal travel cost.
   - The NEV industry is seeing an increase in the use of these vehicles for use beyond the golf course.
2. **NEVs Promote Safety and Provide Independence for Aging Drivers**

With the State’s aging population, we are confronted with the conflicting interest of providing continued mobility to aging drivers while promoting a safe driving environment for all drivers. The State has implemented a process that will result in new driver testing, which will result in the suspension of automobile driver's licenses' for some people. The City’s plan includes a proposal for a separate classification of driver’s license for NEVs.

The loss of a driver's license often brings lifestyle changes that make it hard to cope. Understandably, no one wants to feel isolated and dependent on others for their personal mobility. NEVs are an ideal solution to meet the States competing interest between mobility and safety. NEVs will provide personal mobility to local stops including the grocery store, bus stops and the doctor's office. An NEV commute beats the alternatives of risking a high-speed accident in a conventional automobile or sitting at home waiting for a ride from a friend or relative.

3. **Taking the Lead**

The City of Lincoln, the fastest growing city in the west, has fostered the use of NEVs within Sun City Lincoln Hills, but that is not enough. The City envisions a plan to promote NEV travel throughout the City. With the City's growing retirement population, the opportunity to accommodate NEV travel is at hand. City engineers have already signed and striped some City streets for NEV use. Merchants are providing special parking and charging stations. The City is planning for a pathway and bridge across the Auburn Ravine to accommodate NEV travel on both sides of town. While the City of Lincoln appears to be ahead of the rest of the state, the City is not ahead of their people. More NEVs are on City streets every day. There are NEVs in Rocklin, Roseville, Auburn, and Folsom today and their presence is expanding.

C. **Project Status**

The following steps having been taken by the City in order to implement the NEV transportation plan:

- Placer County Air Pollution Control District (PCAPCD) approved $10,000.00 on August 14, 2003 towards Lincoln’s NEV transportation plan.
- The City has reviewed the Draft Twelve Bridges Golf Cart Transportation Plan (Fehr & Peers) in order to coordinate that plan within the proposed NEV transportation plan.
- SACOG funding guidelines have been altered to include NEVs per the City’s request. Prior to the City’s input, SACOG’s funding guidelines did not mention NEVs.
- The City has coordinated with PCAPCD to include NEV questions to be included in PCAPCD semi-annual transportation survey.
- The City has coordinated with Assemblyman Tim Leslie's office regarding AB 2353.
- The City has submitted NEV funding requests to SACOG through PCTPA, and to date has received funding approval for over $270,000 from SACOG.
- AB 2353 signed into Law on January 1, 2005.
- Public Workshop held on August 30, 2005
- MUTCD approved experimental signage and striping.
- Developed NEV Standards.
- NEV Standards shared with the City of Rocklin
- Putnam Award for Excellence recipient 2006.
D. Reporting Requirements of Assembly Bill No. 2353

City of Lincoln and Rocklin shall jointly submit a report to the Legislature on or before January 1, 2008, in consultation with the Department of Transportation, the Department of the California Highway Patrol, and local law enforcement agencies.

The report shall include the following:

- A description of all NEV transportation plans and their elements that have been authorized up to that time.
- An evaluation of the effectiveness of the NEV transportation plans, including their impact on traffic flows and safety.
- A recommendation as to whether Chapter 7 should be terminated, continued in existence applicable solely to the City of Lincoln and the City of Rocklin in the County of Placer, or expanded statewide.

Chapter 7 shall remain in effect only until January 1, 2009, and as of that date is repealed, unless a later enacted statue, that in enacted before January 1, 2009, deletes or extends that date.

E. Reporting Requirements of CTCDC for experimental signage and striping

Reporting requirements for the CTCDC are similar to the requirements of AB 2353, as stated above. It is recommended the report be submitted to both agencies at the same time.
**Chapter II - Legal Constraints / Opportunities**

This section will outline the current federal, state, and local laws and ordinances relative to implementing a comprehensive NEV transportation plan as well as define the terms necessary to describe such a program. While the existing regulatory framework (AB 2353) allows for NEV travel within the City of Lincoln and Rocklin, an expansion of AB 2353 statewide would facilitate and promote the use of NEVs throughout the State.

A. **Definitions**

1. **“Low Speed Vehicle” or “LSV”** is defined as a motor vehicle, other than a motor truck, having four wheels on the ground and an unladen weight of 1,800 pounds or less, that is capable of propelling itself at a minimum speed of 20 miles per hour and a maximum speed of 25 miles per hour, on a paved level surface. A ‘low speed vehicle’ is not considered a golf cart, except when operated pursuant to Section 21115 or 21115.1 of the California Vehicle Code (CVC) pertaining to operations within a golf course facility/community. (CVC Section 385.5)

   Low-speed vehicle is a relatively new motor vehicle classification created by the National Highway Traffic Safety Administration (NHTSA) in 1998 to permit the manufacture and circulation of small, four-wheeled motor vehicles with top speeds of 20-25 miles per hour. This new classification is codified as Section 571.500 Title 49 code of Federal Regulations and California Vehicle Code Section 385.5. LSVs are required to have California license plates in order to utilize public roads.

2. **“Neighborhood Electric Vehicle” (NEV)** is an electrically powered LSV. They are manufactured by car companies and meet federal safety standards for low speed vehicles. Examples include the Daimler Chrysler “GEM” car. While “low-speed vehicle” is technically the correct term, NEV is the more popularly used and recognized term. NEVs are required to have a California license plate in order to utilize public roads.

3. **“Conventional Golf Cart”** is a motor vehicle having not less than three wheels in contact with the ground, weighs less than 1,300 pounds, is designed to be operated at no more than 15 miles per hour, is designed to carry golf equipment and not more than two persons, including the driver. CVC Section 345. A conventional-golf cart is not a low-speed vehicle.

4. **“Speed-modified Golf Cart”** means a golf cart that is modified to meet the safety requirements of Section 571.500 of Title 49 of the code of Federal Requirements and designed to travel at not more than 20 miles per hour. A modified golf-cart must be inspected and approved as meeting all the safety requirements for a low-speed vehicle and is required to have a California license plate in order to utilize public roads.

5. **“City”** means the City of Lincoln.

6. **“Study Area”** means the City of Lincoln’s sphere of influence.

7. **“NEV Lanes”** means all publicly owned facilities that provide for NEV travel including roadways designated by signs or permanent marking which are shared with pedestrian, bicyclists, and other motorists in the plan area.
B. **Summary of AB 2353 Introduced by Assemblyman Leslie**

1. “It is the intent of the Legislature, in enacting this chapter, to authorize the City of Lincoln and the City of Rocklin in the County of Placer to establish a neighborhood electric vehicle (NEV) transportation plan for a plan area in the city. It is the further intent of the Legislature that this transportation plan be designed and developed to best serve the functional travel needs of the plan area, to have a 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. It is the intent of the Legislature, in enacting this chapter, to encourage discussions between the Legislature, the Department of Motor Vehicles, and the California Highway Patrol regarding the adoption of a new classification for licensing motorists who use neighborhood electric vehicles.” – 1963, Chapter 7, AB 2353

2. For the cities of Lincoln and Rocklin, AB 2353 brings California Law up to date with the new Federal Regulations governing Low Speed Vehicles including Neighborhood Electric Vehicles. AB 2353 provides a formal process for Lincoln and Rocklin to obtain agency approvals to bridge the legal gaps that currently exist for extensive use of Neighborhood Electric Vehicles. In doing this, AB 2353 provides a tool for planning, design, and implementation of a comprehensive NEV transportation program.

3. The current Street and Highways Code Section 1951, which applies to golf carts, was enacted prior to federal legislation designating a low-speed motor vehicle category and prior to the popular emergence of NEVs. NEVs are a safer mode of transportation than golf-carts as they have stricter safety requirements. Further, unlike golf-carts, NEVs are motor vehicles subject to same rules and regulations governing motor vehicles.

4. A key aspect of AB 2353 is it provides local jurisdictions with choice. Federal Law allows NEVs on all streets posted 35 mph or less. AB 2353 allows Lincoln and Rocklin to determine which streets posted 35 mph and under are appropriate for NEVs. The City of Lincoln is supporting NEV use, but has some streets posted 35 mph that are deemed unsafe for NEVs.

5. Until now NEVs were prohibited from streets posted above 35 mph. AB 2353 allows NEVs on streets posted above 35 mph where designated NEV lanes are available. Similar to bicycle laws, the bill describes three classes of NEV lanes.

6. AB 2353 allows NEVs to use and cross State highways where deemed safe and appropriate by the City and the State Department of Transportation

7. According to a recent survey of NEV owners, NEV users in the City of Lincoln drive an average of 1000 miles per year per NEV. That is 1000 miles of otherwise short cold start automobile trips. AB 2353 lets the cities of Lincoln and Rocklin accommodate the expanding popularity of low cost Neighborhood Electric Vehicles, and reap the transportation and air quality improvement benefits.

8. NEVs are also an ideal transportation option for aging drivers. As low-speed vehicles with a top speed of 25 mph and a limited travel range, NEVs have the ability to provide continued mobility and independence to aging and disabled drivers. Through AB 2353 the DMV committed to work with Assemblyman Leslie’s office and the City of Lincoln to explore the feasibility of offering separate category of driver’s license to NEV drivers.

9. AB 2353 was signed by the governor and became law January 1, 2005.
C. Existing Regulations for NEVs
1. NEVs must comply with all the rules and regulations for a motor vehicle as set for in the California Vehicle Code. Vehicle Code §21251 provides in relevant part that:

   “…a low-speed vehicle is subject to all the provisions applicable to a motor vehicle, and the driver of a low-speed vehicle is subject to all the provisions applicable to the driver of a motor vehicle or other vehicle, when applicable, by this code or any other code, with the exception of those provisions which, by their very nature, can have no application.”

2. NEVs must be registered with the State Department of Motor Vehicles and the driver must hold a valid California driver's license and be insured.

3. NEVs may travel on any street with a posted speed limit of 35 miles per hour or less. However, the City, by local ordinance or resolution, may restrict or prohibit the use of NEVs. CVC §21266(a). The City plans to designate approved NEV travel routes to direct NEV traffic to the safest available route.

4. NEVs may cross state-highways at controlled intersections only. Crossing at uncontrolled intersections is permitted with the approval of the agency with primary responsibility for that intersection. CVC §21260(2).

D. Safety Standards
NEVs must meet all safety standards for low-speed vehicles as defined by NTHSA. All vehicles sold as NEVs, such as the GEM, already meet these safety standards. Modified golf carts must include these safety modifications to comply with federal safety mandates. All NEVs must be equipped with:

- Seat belts (lap only, or lap and shoulder)
- Brake lights
- Rear lights
- Headlights
- Mirrors, one of the following selection: (1) left side and right side mirrors, (2) left-side and rear-view mirrors, or (3) multi-directional cross bar window.
- Windshield
- Horn
- Front and rear turn signal indicators
- Rear red-reflectors
- Parking brake
- Covered passenger compartment.

E. NEVs in Golf Cart Lanes
Current Law in Lincoln and Rocklin per AB 2353 allows dual use; however, outside of Lincoln and Rocklin, a conflict still exists.

F. NEV/Bicycle Lane Compatibility
NEV travel is permitted by AB 2353 on roads with speed limits in excess of 35 mph where there is a designated Class II NEV lane on the right shoulder. Bicycles are permitted to travel in these designated NEV lanes.
Chapter III - Energy/Cost Considerations

A. Energy Consumption
   1. Standard Car (27.5 mpg)
   2. NEV (Equivalent to 150mpg, 0.223 kwh/mile)

B. Operational Costs (For standard fleet car and NEV)

Table 1 – Annual Operating Costs

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<thead>
<tr>
<th>Vehicle Type</th>
<th>Insurance</th>
<th>Registration</th>
<th>Fuel Costs</th>
<th>Maintenance</th>
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Table 2 – Operating Costs per Mile

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</table>

C. Potential Energy Sources
   1. Photovoltaic Cells/Batteries
   2. Fuel Cells
   3. Utility/Batteries

D. Energy Benefits
   The cost to operate an NEV is less than 1/5 that required for a conventional automobile. In accordance with the July 1, 2002 report to CEC (p600-02-020F) demonstration of NEVs, NEVs achieve an equivalent mpg of 150. The actual measured energy use is 0.223 kwh/mile. The average auto mpg is 27.5 as of 2002, and less in urban traffic.

E. Incentives/Subsidies
   1. Federal: 2.5% of purchase price tax credit
   2. Local: designated parking spaces and lanes, free charging stations.
Chapter IV - Air Quality Benefits

A. Air Quality Setting
The city of Lincoln is located within the Sacramento Federal Non-attainment Area (SFNA), a region federally designated as “severe non-attainment” of federal air quality standards for ozone air pollution. Only the Los Angeles basin in California is designated as “extreme” with worse air quality. Under federal law, the SFNA must demonstrate attainment by 2005, then maintain healthy air thereafter. NEVs will provide real, quantifiable emission benefits for local and regional air attainment strategies.

NEV trips made possible by the development of this project will produce a variety of air emission benefits to Lincoln and its citizens, and to the five-county air basin. Ozone air pollution is formed by “tailpipe” oxides of nitrogen (NOx) and reactive organic gases (ROG) mixing in the presence of sunlight. The great majority of local ozone air pollution comes from “mobile sources”, with the largest portion resulting from light-duty on-road vehicle use. Some air pollution also comes from evaporative (fuel) emissions that escape from the vehicle during fueling and operation. In winter, carbon monoxide (CO), a product of incomplete combustion that increases as temperatures drop, can be a problem near heavily traveled intersections and in lower lying areas that tend to trap air pollutants in stagnant weather conditions.

Vehicle exhaust also contains toxic air contaminants, such as benzene and formaldehyde. Emission control systems take time to come up to operating temperature, especially in winter. A recent report to the California Energy Commission (TIAX, LLC) stated:

“It is well documented that cold-start emissions have significant impact on air quality. Due to cold-start fuel enrichment, subsequent quenching of hydrocarbons in a cold engine, and the delayed attainment of proper operating temperatures of the catalytic converter, between 60 and 80% of the toxic air emissions from automobiles occur during the cold-start period.”

The good news is that NEVs eliminate the issue of cold starts, with their high rates of toxic and criteria pollutant emissions.

B. NEV Emission Benefits to Lincoln and the Air Basin
NEVs eliminate NOx, CO, ROG and toxics emissions that otherwise result from internal combustion-powered vehicle. NEVs operating in Lincoln will displace gasoline vehicle trips. To demonstrate the emission benefits of a successful NEV program, the following assumptions were used to model the most important emission benefits with the URBEMIS2002 mobile source emissions estimation program:

- 5000 NEVs at program buildout
- 2008 is the modeling year
- Each NEV will travel 1000 miles/year
- NOx is primary target; emission reductions annualized from summer conditions
- Only vehicle emissions were calculated with URBEMIS2002 (no area or construction emissions)
- Trip characteristics derived as 2.78 miles/each for 1000 mile/year
- Trips calculated as home to work
- 95% light duty passenger car and 5% light duty truck ratio assumed
Table 3 – Lbs/Day Emissions Reduced with 5000 NEVs

<table>
<thead>
<tr>
<th></th>
<th>ROG lbs/day</th>
<th>NOx lbs/day</th>
<th>CO lbs/day</th>
<th>SO2 lbs/day</th>
<th>PM10 lbs/day</th>
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Table 4 – Tons/Year Emissions Reduced with 5000 NEVs

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<tr>
<th></th>
<th>ROG tons/year</th>
<th>NOx tons/year</th>
<th>CO tons/year</th>
<th>SO2 tons/year</th>
<th>PM10 tons/year</th>
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</tr>
</tbody>
</table>

C. Cost-Effectiveness of NEV Air Emission Benefits for Lincoln

The cost of reducing air pollution is often calculated in units of dollars spent per unit of emission reduction received. In simple terms, when the local Placer Air Pollution Control District calculates the value of funding it provides “mobile source” (vehicle) emission reduction projects, including NEVs, it divides the tons of emissions reduced by what it spent to achieve them.

The NEV project does NOT require large investments by air agencies, in spite of the considerable emission reductions that will occur. This is because NEVs will take advantage of existing roadway improvements and infrastructure. Since NEVs have a much lower cost to operate, and even “green image” environmental benefits important to increasing numbers of drivers and local businesses, the “costs” for the emission reductions produced by the NEVs will be substantially underwritten by the vehicle buyer. Therefore, the cost-effectiveness of the emission benefits to Lincoln and the broader Sacramento air basin is a bargain.

Because NEVs operate at essentially zero emissions, (using grid power) vehicles with an internal combustion engine will operate with greater emissions. No grid power in the Sacramento region is generated in the local air basin, and it is reasonable to argue that because NEVs produce a wide range of emission benefits to society they should be able to claim that their grid power comes from hydroelectric or other environmentally benign sources.

D. Luke Air Force Base NEV Fleet Demonstration Program Report

The September 14, 2000 Luke Air Force Base NEV Fleet Demonstration Program report provided the following air quality benefits for each of their NEVs:

Table 5 – Air Quality Benefits

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>10-Year Total Miles</th>
<th>10-Yr VOC lb</th>
<th>10-Yr CO lb</th>
<th>10-Yr NOX lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEV Elect.</td>
<td>13,000</td>
<td>(52.0)</td>
<td>(390.0)</td>
<td>(67.6)</td>
</tr>
<tr>
<td>Gas Auto</td>
<td>34,000</td>
<td>136.0</td>
<td>1,020.0</td>
<td>176.8</td>
</tr>
</tbody>
</table>
E. Community Design Benefits
The NEV program represents "inside out transportation planning"; or planning from the user's perspective.

F. Environmental Justice
The City of Lincoln’s proposed NEV transportation plan will enhance the quality of life for aging, disabled, and low-income persons within the City.

1. NEVs Will Provide Inexpensive Mobility for Low-Income Drivers
The high cost of a conventional automobile can be a barrier to independence and mobility for low or fixed income persons. The initial and operating costs of an NEV are substantially less than those of a conventional automobile.

A new NEV retails for approximately $7,560.00. Used NEVS are also available for less. The least expensive conventional automobile is at least three times the amount of a new NEV.

The operating costs of an NEV are also substantially lower than those of a conventional automobile. The average annual operating cost for an NEV including insurance, registration, fuel, and maintenance is $559.00. The same costs for a conventional automobile are $3,520.00; over six times the operating costs of an NEV.

2. NEVs Will Promote Safety and Provide Independence for Aging and Disabled Drivers
With the State’s aging population, we are confronted with the conflicting interest of providing continued mobility to aging drivers while promoting a safe driving environment for all drivers. After the tragic accident in Southern California, where an elderly driver crashed into a farmers market killing several bystanders, the State’s population has become acutely aware of the dangers of drivers with diminished skills often brought on by old age. After the accident, the State immediately began considering new driver’s license testing, a move that will inevitably result in the loss of a driver’s loss for drivers with diminished driving skills, included the elderly and disabled.

The loss of a driver’s license can lead to isolation and dependence on others for mobility. The proposed NEV transportation plan will provide for a special driver’s permit, issued by the local jurisdiction, which will allow aging or disabled persons to drive an NEV in designated NEV routes. Since NEVs are smaller, have a limited travel range, and a top speed of 25 miles-per-hour, they provide a safe alternative to impaired drivers when compared to a conventional high-speed automobile. The emergence of an NEV transportation plan in the City of Lincoln will provide continued mobility and independence to aging or disabled drivers, allowing them to access businesses, medical centers, and visit friends while driving an NEV.

NEVs also will reduce the need for comparatively expensive and under-funded dial-a-ride programs.

In conclusion, the City’s proposed NEV transportation plan will enhance the lives of low-income, elderly, and disabled persons throughout the City by providing them with affordable transportation options. The City plans to conduct outreach to all members of the community, including the elderly, disabled, low-income, and other minority groups to determine their transportation needs when preparing the City’s comprehensive NEV transportation plan.
G. Conclusion – Air Quality Benefits
Facilitating NEV operation will result in substantial air quality benefits to Lincoln, while providing extremely cost-effective pollutant reductions to assist the air basin in attaining and then maintaining federally enforced ambient air quality standards. Cost-effectiveness per ton of emission reduced will be unsurpassed, since air agencies will not be expected to provide per-vehicle subsidies. With deployment of 5000 NEVs as a result of this proposal, nearly eighteen tons per year of ozone pre-cursor emissions will be avoided based on URBEMIS estimation. Moreover, once this NEV pilot study is completed for Lincoln, results will be made available to other communities similarly interested in reducing dependence on petroleum products while simultaneously reducing vehicle-caused air pollution.
Chapter V - Community Considerations

The NEV program represents "inside out transportation planning"; or planning from the user's perspective.

A. NEVs Provide Multiple Community Benefits

NEVs are already in use in Lincoln and Rocklin areas within a limited radius of golf courses. NEV users are asking officials of both Lincoln and Rocklin "how can I legally get to a shopping area in my NEV?" The NEV project is designed to accommodate NEV use and is already successful at eliminating automobile trips.

NEVs travel at a slower speed than autos and provide opportunity to develop a more friendly cohesive community at the neighborhood level than fast autos. The slower speed also contributes to NEV safety for impaired drivers.

As discussed in Chapter II, Legal Constraints, the NEV project included legislation (AB 2353) that has a requirement for DMV to work with the California Highway Patrol and the Legislature to create a new driver’s license classification for NEV operation. With an "NEV operators permit" a person who no longer felt comfortable to drive an automobile could continue to be independent. NEVs will provide individual transportation to public transit systems and satisfy some of the more costly unmet transit needs.

NEVs operate for about 20% of the cost of owning and operating automobiles. For low income families that live near their work, an NEV could replace a gross polluting auto. Part of the NEV project includes proposals to include NEVs in State incentive, grant and rebate programs.

B. Discussion of other NEV/Golf Cart Communities

The City of Lincoln’s efforts to accommodate and encourage NEVs has many of its roots in other electric vehicle communities. With the advent of the active adult communities, (age 55 or older) golf carts and electric vehicles have become a common sight.

Other Sun City communities have long encouraged the use of electric vehicles. That is certainly the case in Lincoln Hills where the use of electric vehicles in local neighborhoods has increased over the years, since first being introduced in the spring of 1999. Rush hour in Lincoln Hills isn’t necessarily at 8 a.m. and 5 p.m., it is more likely at 10 a.m. after the morning softball game, or 2:30 p.m. after golf as the NEVs and golf cart vehicles make their way to the neighborhood shops.

Every day in Lincoln Hills numerous electric vehicles make their way through neighborhood connections to get a cup of coffee from Starbucks’, or go to Safeway for groceries or do their banking at any of the four neighborhood banks. NEVs are convenient, safe, affordable, non-polluting and good for the local economy. Business owners near Sun City Lincoln Hills and other Sun City communities appreciate electric vehicle users patronizing their businesses and accommodate NEV and Golf Cart use with special parking spaces.

As a part of this study and proposed pilot program for the City of Lincoln, it might be helpful to review some other electric vehicle plans over the past 10 to 15 years. Electric vehicle activities have been taking place in California and Arizona Sun City communities for quite some time now. NEVs have proven to be natural, efficient alternative forms of transportation in many active adult communities.
These programs were started for ease of accessibility to neighborhood activities through use of an electric vehicle. The various community programs started with golf cart transportation plans, which still exist and now include a good amount of NEV use as well, depending on the community and access to roadways and commercial centers. It is worth a quick review and look at other Sun City/Del Webb communities.

CONCLUSION:
NEVs are an affordable, safe, non-polluting alternative to traditional modes of transportation. It is apparent that as communities make commercial and downtown business sites available and accessible, the use of NEVs increases. NEVs have proven to be natural, efficient alternative forms of transportation and will provide a multitude of benefits to the City of Lincoln.
Chapter VI - NEV Transportation Planning

A. Background
Existing law (Chapter 6, Streets and Highways Code, Section 1950 – 1965) 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. Assembly Bill 2353 adds Chapter 7 (commencing with Section 1963) to Division 2.5 of the Streets and Highways Code to authorize the City of Lincoln (until January 1, 2009) to establish a neighborhood electric vehicle (NEV) transportation plan subject to the same review process established for a golf cart transportation plan (GCTP). The bill defines “neighborhood electric vehicle (NEV)” the same as a “low speed vehicle.” Within California, only electric powered LSVs can be sold. Therefore, all LSVs in the state of California are NEVs.

In enacting Chapter 7, it is the intent of the Legislature to authorize the City of Lincoln and Rocklin in the County of Placer to establish a neighborhood electric vehicle (NEV) transportation plan. It is the further intent of the Legislature that this 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.

The City of Lincoln NEV project 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 downtown Lincoln commercial areas. This effort will result in air quality improvements, energy savings, reduced travel costs, and increased mobility and independence for aging and impaired drivers.

Minor modifications to the existing street and circulation system are needed to accommodate NEVs. The City plans to implement signing and striping improvements consistent with this report, create special parking spaces, and develop a Class II NEV path system to facilitate access to the City of Lincoln, and to increase safety.

The City of Lincoln is well positioned to integrate the beneficial use of NEVs with their existing golf cart transportation system. NEVs are already circulating in the Sun City – Lincoln Hills development and special parking areas are provided in the adjacent Safeway shipping center. The overall goal is to complete a comprehensive NEV circulation system so that the number of users will increase commensurate with the amount of new development planned for Twelve Bridges and the City of Lincoln proper. Figure 1 shows the project study area.

B. Data Collection and Review
We reviewed the following materials in preparation of this report.

- The Revised Twelve Bridges Specific Plan EIR (August 1997)
- City of Lincoln, NEV Transportation Plan, CMAQ Application to SACOG, 1-15-04
- Administrative Draft – Transportation and Circulation Section 4.2 (May 2000)
- The City of Lincoln General Plan
- The Sun City – Lincoln Hills Golf Cart Transportation Plan (2001)
- City of Lincoln Parkway Pointe Offsite Improvement Plans (November 2004)
• The City of Lincoln current street design standards (2003)
• City of Palm Desert Golf Cart Transportation Plan (1999)
• 2000 Census journey-to-work data
• AB 2353 (signed into law)
• Manufactures brochures and dimensions for typical golf carts and NEVs
• City of Lincoln Neighborhood Electric Vehicle Transportation Program Draft #2 Report prepared by MHM Engineers & Surveyors, 12-2-03.

This information provides a basis for determining the feasibility of integrating NEVs into the existing golf cart circulation system within the City of Lincoln, identifying key crossing points that allow access to planned retail, commercial, educational, and medical facilities in Twelve Bridges, and recommending street standards, crossing design, and signage to accommodate NEVs. The existing golf cart facilities and circulation routes in the City of Lincoln are summarized below along with their feasibility of accommodating NEVs.

C. Mode Share and Trip Generation Summary
Table 9 provides information from the 2000 Census on the mode shares for journey-to-work for Placer County, City of Lincoln and City of Rocklin. For the City of Lincoln (including Twelve Bridges) the automobile continues to be the primary mode of travel to work. Drive alone and carpool account for approximately 96 percent of all work trips.

Figure 1 – Project Study Area
Table 6 – Mode Shares from the 2000 Census Journey to Work

<table>
<thead>
<tr>
<th>City</th>
<th>Drive Alone</th>
<th>Carpool</th>
<th>Transit</th>
<th>Bicycle</th>
<th>Walk</th>
<th>Other Means</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lincoln CA</td>
<td>79.8%</td>
<td>16.5%</td>
<td>0.0%</td>
<td>0.4%</td>
<td>3.0%</td>
<td>0.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Rocklin CA</td>
<td>86.9%</td>
<td>9.9%</td>
<td>0.8%</td>
<td>0.6%</td>
<td>1.5%</td>
<td>0.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Roseville CA</td>
<td>86.4%</td>
<td>10.3%</td>
<td>1.4%</td>
<td>0.4%</td>
<td>1.0%</td>
<td>0.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 7 summarizes the number of dwelling units and daily person trips for Sun City – Lincoln Hills and for the remainder of Twelve Bridges. Recent data (September 2004) from the City of Lincoln shows that since 1998, there have been 3,356 building permits issued for the City of Lincoln excluding Sun City – Lincoln Hills. This represents approximately 50% of the adopted General Plan build-out. The Del Webb community (Sun City – Lincoln Hills) has received 5,521 building permits during the same time frame, which represents approximately 80 percent of plan build-out.

Table 7 – Trip Generation Summary for Sun City - Lincoln Hills and Twelve Bridges

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Daily Trip Rate</th>
<th>Total Daily Trips</th>
<th>Sun City - Lincoln Hills</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density Residential</td>
<td>9.0/d.u.</td>
<td>33,525</td>
<td>0</td>
<td>33,525</td>
</tr>
<tr>
<td>High Density Residential</td>
<td>6.5/d.u.</td>
<td>6,825</td>
<td>0</td>
<td>6,825</td>
</tr>
<tr>
<td>Age-Restricted Residential</td>
<td>4.6/d.u.</td>
<td>0</td>
<td>31,280</td>
<td>31,280</td>
</tr>
<tr>
<td>Commercial</td>
<td>525/acre</td>
<td>26,075</td>
<td>14,700</td>
<td>40,775</td>
</tr>
<tr>
<td>Employment Center</td>
<td>230/acre</td>
<td>18,860</td>
<td>0</td>
<td>18,860</td>
</tr>
<tr>
<td>Schools</td>
<td>50/acre</td>
<td>3,750</td>
<td>0</td>
<td>3,750</td>
</tr>
<tr>
<td>Golf Course</td>
<td>37.6/hole</td>
<td>677</td>
<td>1,354</td>
<td>2,031</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>89,712</td>
<td>47,334</td>
<td>137,046</td>
</tr>
</tbody>
</table>

Source: City of Lincoln Traffic Model; Del Webb Specific Plan DEIR, 1993; Revised Twelve Bridges Specific Plan EIR (1997); City of Lincoln Building Permit Section

Feasibility: There is ample opportunity to increase non-auto mode shares within the City of Lincoln based on recent census data. Walking already shows a higher percentage of work trips than either Roseville or Rocklin. The use of golf carts and/or NEVs is captured in the “Other” category (0.2 percent). The potential for mode shifting to bike, walk or NEV travel within the City of Lincoln will depend on several factors including, a well connected on-street and off-street system, jobs-housing balance (for work related trips), adequate parking and major attractors and activity centers, and appropriate safety measures. The City of Lincoln has taken important steps to improve these elements through adoption of their bicycle master plan, development of a citywide extended golf cart transportation plan, and development of the main village and surrounding commercial, retail and employment areas. If NEV travel accounted for just one percent of the current Del Webb generated trips, there would be a potential of 400 daily trips by this efficient non-polluting mode. If the same one percent is applied to the total trips generated by Del Webb and Twelve Bridges, over 1,000 daily trips by NEV are possible.
New NEV trips resulting from the development of the circulation plan will produce a variety of air emission benefits to Lincoln and its citizens, and to the five-county air basin. The great majority of local ozone air pollution comes from “mobile sources”, with the largest portion resulting from light-duty on-road vehicle use. In winter, carbon monoxide (CO) can be a problem near heavily traveled intersections and in lower lying areas that tend to trap air pollutants. The good news is that NEVs eliminate toxic emissions that otherwise result from these mobile sources.

Although trip length information is difficult to establish, a neighborhood electric vehicle program questionnaire was distributed to NEV owners in the City of Lincoln in 2003 as part of the MHM Draft NEV Report, in an attempt to refine usage and trip length information. The results from 35 responses showed the following trends:

- 77% of respondents use their NEV at least 5-days a week
- 70% of respondents drive their NEV more than 500 miles per year and 23% drive more than 1,000 miles per year
- 62% of respondents use their NEV for purposes other than recreation or golf
- 38% indicated they would drive at least 50 additional miles per week if they were allowed to drive anywhere within the City of Lincoln, and if it were safe to do so

The City of Lincoln – NEV Transportation Plan CMAQ application provided an estimate of the air quality benefits available from a mode shift to NEVs and bicycles within the downtown area based on the survey results. Table 8 provides a summary of the information. The calculation methodology is detailed in the application.

### Table 8 – Air Quality Benefits of NEV and Bicycle Use

<table>
<thead>
<tr>
<th>Category</th>
<th>NEV</th>
<th>Bike</th>
<th>Combined</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Auto Trip Reduced</td>
<td>312,732</td>
<td>28,322</td>
<td>341,054</td>
<td>Trips/year</td>
</tr>
<tr>
<td>Annual Auto VMT Reduced</td>
<td>2,501,856</td>
<td>56,644</td>
<td>2,558,500</td>
<td>Miles/year</td>
</tr>
<tr>
<td>Ozone (ROG)</td>
<td>4,146</td>
<td>174</td>
<td>4,320</td>
<td>Lbs/year</td>
</tr>
<tr>
<td>Nitrous Oxide (NOx)</td>
<td>3,636</td>
<td>114</td>
<td>3,750</td>
<td>Lbs/year</td>
</tr>
<tr>
<td>Particulates (PM10)</td>
<td>1,245</td>
<td>29</td>
<td>1,274</td>
<td>Lbs/year</td>
</tr>
<tr>
<td>Annual Emission Reduction</td>
<td>9,027</td>
<td>317</td>
<td>9,343</td>
<td>Lbs/year</td>
</tr>
</tbody>
</table>

Source: NEV Transportation Plan CMAQ Application to SACOG 1/04

**Feasibility:** The potential for NEV and bicycle use resulting from an approved NEV circulation plan results in very positive air quality benefits for the City of Lincoln and ultimately the 5-county region.

**D. Traffic Volume Data**

The feasibility of using NEVs on the study area roadways considered “level of service (LOS)” and traffic volume thresholds. Table 9 provides the average daily traffic (ADT) volume LOS for various roadway types. These thresholds have been established for previous environmental analyses in the Cities of Lincoln, Rocklin and the Counties of Placer and Sacramento. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst in terms of congestion and delay.
Table 9 – Average Daily Traffic Volume Level of Service Thresholds

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>LOS A</th>
<th>LOS B</th>
<th>LOS C</th>
<th>LOS D</th>
<th>LOS E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-Lane Street</td>
<td>9,000</td>
<td>10,700</td>
<td>12,000</td>
<td>13,500</td>
<td>15,000</td>
</tr>
<tr>
<td>Four-Lane Undivided Arterial</td>
<td>18,000</td>
<td>21,300</td>
<td>24,000</td>
<td>27,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Four-Lane Divided Arterial</td>
<td>20,250</td>
<td>23,625</td>
<td>27,000</td>
<td>30,375</td>
<td>33,750</td>
</tr>
<tr>
<td>Four-Lane Restricted-Access Arterial</td>
<td>21,600</td>
<td>25,200</td>
<td>28,800</td>
<td>32,400</td>
<td>36,000</td>
</tr>
<tr>
<td>Six-Lane Divided Arterial</td>
<td>30,315</td>
<td>36,000</td>
<td>40,500</td>
<td>45,560</td>
<td>50,525</td>
</tr>
<tr>
<td>Six-Lane Restricted-Access Arterial</td>
<td>32,400</td>
<td>37,800</td>
<td>43,200</td>
<td>48,600</td>
<td>54,000</td>
</tr>
<tr>
<td>Two-Lane Freeway</td>
<td>18,800</td>
<td>26,400</td>
<td>34,000</td>
<td>38,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Four-Lane Freeway</td>
<td>37,600</td>
<td>52,800</td>
<td>68,000</td>
<td>76,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Six-Lane Freeway</td>
<td>56,400</td>
<td>79,200</td>
<td>102,000</td>
<td>114,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Two-Lane Conventional Highway</td>
<td>3,100</td>
<td>4,800</td>
<td>7,900</td>
<td>13,500</td>
<td>22,900</td>
</tr>
</tbody>
</table>


The City of Lincoln has adopted LOS C as their minimum criteria for urban area intersections and roadways. The feasibility of allowing NEVs to travel on area roadways were evaluated by comparing ADT to the daily volume LOS thresholds in Table 10. Figure 2 shows 2025 traffic volumes for the Main Village including Twelve Bridges Drive and East Lincoln Parkway. The future (2025) traffic forecasts are based on trip generation estimates for proposed General Plan Amendment land uses, prepared by Fehr &Peers for the Main Village.
Feasibility: The feasibility of operating NEVs on roadways within the City of Lincoln and Twelve Bridges based on speed limits and volumes is shown in Table 10.

Table 10 – Operational Feasibility of NEVs on Study Roadways

<table>
<thead>
<tr>
<th>Facility (Speed Limit)</th>
<th>Roadway Speed Limit</th>
<th>2020 Traffic Volume</th>
<th>LOS C Threshold</th>
<th>Operational Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 193</td>
<td>35 mph</td>
<td>18,000</td>
<td>12,000</td>
<td>Limited†</td>
</tr>
<tr>
<td>Ferrari Ranch Road</td>
<td>35 mph</td>
<td>19,000</td>
<td>24,000</td>
<td>Yes‡</td>
</tr>
<tr>
<td>Sterling Parkway</td>
<td>35 mph</td>
<td>17,000</td>
<td>24,000</td>
<td>Yes</td>
</tr>
<tr>
<td>E. Lincoln Parkway</td>
<td>35 mph</td>
<td>22,000</td>
<td>24,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Twelve Bridges Drive*</td>
<td>35 mph</td>
<td>20,000</td>
<td>24,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Street C (Main Village)</td>
<td>35 mph</td>
<td>2,100</td>
<td>12,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Street B (Main Village)</td>
<td>25 mph</td>
<td>6,200</td>
<td>12,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Fieldstone Drive (Main Village)</td>
<td>25 mph</td>
<td>2,100</td>
<td>12,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Street A (Main Village)</td>
<td>25 mph</td>
<td>9,900</td>
<td>24,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Street K (Main Village)</td>
<td>25 mph</td>
<td>8,200</td>
<td>12,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Street J (Main Village)</td>
<td>25 mph</td>
<td>1,200</td>
<td>12,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Downtown Lincoln (Residential Streets) east of Highway 65</td>
<td>25 mph</td>
<td>No recent estimates</td>
<td>Not expected to exceed 12,000</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Fehr & Peers 2004

*The segment of Twelve Bridges Drive between State Route 65 and East Lincoln Parkway has a posted speed limit of 35 mph. Other portions of Twelve Bridges Drive are currently posted at 45 mph.

NEVs would be allowed to travel on SR 193 between Ferrari Ranch Road and A Street to access the downtown residential streets in Lincoln. NEVs will not be allowed on SR 193 east of Ferrari Ranch Road. Although NEVs are legal to operate on Ferrari Ranch Road, a separate Class II path system is proposed when the road is built out to complete width.
Figure 2 – Average Daily Traffic Volumes
E. Standard NEV Signage and Street markings

The standard NEV signage and street markings are shown in Appendix B. These signs and markings are consistent with the MUTCD 2003 California Supplement, May 20, 2004 issued by the California Department of Transportation. The size and general design of signage for the NEV plan is consistent with Part 9 of the MUTCD for bicycles and with the adopted 2001 Golf Cart Transportation Plan (GTCP) for Sun City – Lincoln Hills.

The following standards and policies for NEV signing and pavement markings are recommended for use within the plan area.

1. Combination NEV/Bike Lane Sign. The Combination NEV/Bike Lane sign should be placed on NEV Lanes where a Class II Bike Lane is also provided. The sign should be placed at the far side of collector street intersections and at a minimum of one-half mile intervals on all continuous residential streets. (Appendix B Figure 1)

2. NEV Pavement Marking. The Pavement Marking should be placed on local streets, which have been designated as NEV Routes. (Appendix B Figure 2)

3. NEV Lane Striping. The stripe is to be placed between the traffic lane and the NEV/Bike lane. (Appendix B Figure 3)

4. NEVs Prohibited Beyond This Point. The NEV Prohibited Beyond This Point educational plate may be placed at entrances to public streets that will not accommodate NEV travel. This sign may be placed on the right-hand side of the roadway approximately 25 feet past the intersection so it is visible to operators before they enter that portion of the public right-of-way (Appendix B Figure 4)

5. NEV Route. The NEV Route sign should be placed on local streets, which have been designated as NEV Routes. The sign should be placed at the far side of collector street intersections and at a maximum of one-half mile intervals on all continuous residential streets. (Appendix B Figure 5)

F. NEV Standards: Lane Widths and Parking Requirements

1. Functional Classification of NEV Facilities

   a. Two-Way Paths are defined for the purposes of this study as an off-street path with a minimum width of 14 feet plus a one foot shoulder on each side (total right-of-way width of 16 feet). This width is deemed necessary to allow NEVs to pass safely in the opposite direction considering their size and speed (See Table 13). NEV paths are designed to provide access between residential areas and commercial/retail areas, and between public streets and private property. The multi-modal design of the paths is intended for pedestrians, bicyclists, skateboarders and roller-bladders to share the facility. Note: The minimum path width may be reduced to 12-feet at the discretion of the Director of Public Works.

   b. One-Way Paths are defined for the purposes of this study as an off-street path with a minimum width of 8 feet plus a one foot shoulder on each side (total right-of-way width of 10 feet). The 8 feet width is deemed necessary to allow pedestrians, bicyclists, skateboarders and roller-bladders to share the facility.
c. **Class II NEV/Bike Lanes:** NEV/bike lanes are portions of public roadways that are designated by signs and pavement markings for NEV/bike travel. NEV/bike lanes should be 7 feet wide and allow NEVs, bikes and golf carts (within the Golf Cart Transportation Plan) to travel adjacent to automobile traffic but within a striped separated space. Bicyclists may share NEV lanes if there is not a separate bicycle lane on the roadway. In addition, NEV/bike lanes may be reduced to 6-feet at the discretion of the Director of Public Works. NEV/bike lanes are appropriate on arterials and collector streets that meet the following design criteria:

- **Road Design Speed** – 45 miles per hour or less
- **Automobile Traffic Volume** – 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 Public Facilities Element (PFE Policy 5-1) of the General Plan requires streets and intersections to operate at no worse than LOS “C”. Based on the traffic volume thresholds shown in Table 12, a two lane collector street suggests a target vehicular threshold of 12,000 vehicles per day to maintain LOC C.

d. **Class III NEV Routes** provide for shared use by NEVs with conventional vehicle traffic on streets with a posted speed limit of 35 miles per hour or less.

2. **Minimum Street Standards**

The minimum street standards and typical cross-sections are shown in Appendix A. These cross-sections are based on existing City of Lincoln standards and reflect similar design widths for NEV and/or golf cart travel in Sun City – Lincoln Hills and the City of Palm Desert. Included are:

- Two lane residential collector streets with Class II NEV/Bike lanes
- Four lane arterials with Class II NEV/Bike lanes
- Residential streets (shared use)
- One-way Class 1 NEV/Golf Cart Path (off-road)
- Two-way Class 1 NEV/Golf Cart Path (off-road)

Table 11 provides a physical and operational comparison of NEVs and Golf Carts based on manufacturer specifications. The additional width and speed of the NEV requires Class I paths to be a minimum of 14-feet of pavement with at least a one foot shoulder on each side for a total right-of-way width of 16 feet. Similarly, one way Class 1 NEV/Golf Cart paths are recommended to be 8 feet of pavement with at least a one foot shoulder on each side for a total right-of-way width of 10 feet. This will allow for multi-modal travel and passing in the same direction.

<table>
<thead>
<tr>
<th>Table 11 – NEV vs. Golf Cart Specifications and Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neighborhood Electric Vehicle (NEV) vs. Standard Golf Cart</strong></td>
</tr>
<tr>
<td>Specifications and Comparisons</td>
</tr>
<tr>
<td><strong>CATEGORY</strong></td>
</tr>
<tr>
<td>****</td>
</tr>
<tr>
<td>Curb Weight</td>
</tr>
<tr>
<td>GVW</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Height</td>
</tr>
</tbody>
</table>
Table 12 provides a comparison of operational characteristics across various “low-speed” modes. All of these modes should be able to use the Class I NEV/Golf Cart paths within the plan area.

### Table 12 – Operational Characteristics Across Low-Speed Modes

<table>
<thead>
<tr>
<th>Low Mode</th>
<th>Speed (mph)</th>
<th>Width (feet)</th>
<th>Braking Distance (feet)</th>
<th>Turning Radius (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrians</td>
<td>2.7</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Bicycles</td>
<td>15</td>
<td>3.3</td>
<td>15</td>
<td>56.3</td>
</tr>
<tr>
<td>Skates</td>
<td>10.5</td>
<td>4</td>
<td>20</td>
<td>NA</td>
</tr>
<tr>
<td>Skateboards</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Scooters</td>
<td>5 to 8</td>
<td>1.2</td>
<td>25</td>
<td>NA</td>
</tr>
<tr>
<td>Wheelchairs</td>
<td>4 to 7</td>
<td>2.5</td>
<td>NA</td>
<td>2 to 4</td>
</tr>
<tr>
<td>Golf Carts</td>
<td>5 to 15</td>
<td>3.9</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>NEVs</td>
<td>5 to 30</td>
<td>4.6</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: TRB Paper “What the Literature Says about Low Speed Modes,” Rodier, Shaheen, and Chung, August 2003; Manufacturer specifications for GEMCO and CLUB CAR
3. **Proposed NEV Circulation Plan**

The proposed NEV Transportation Plan is illustrated in Figure 3.

**Figure 3 – Proposed Circulation Plan**

The following outlines the NEV routes included in the NEV Transportation Plan:

1. Venture Drive – From Aviation Boulevard to Joiner Parkway
2. Joiner Parkway – From Venture Drive to East Lincoln Parkway
3. East Lincoln Parkway – From Joiner Parkway to Lincoln City Limits
4. Twelve Bridges Drive – From Highway 65 to Sierra College Boulevard
5. Ferrari Ranch Road - From Joiner Parkway to Highway 193
6. Ferrari Ranch Road – From Moore Road to Joiner Parkway
7. Groveland Lane – Ferrari Ranch Road to Home Depot
8. Highway 193 – From Ferrari Ranch Road to East Avenue
9. East Avenue – From Highway 193 to Virginiatown Road
10. Virginiatown Road – From East Avenue to Harrison Road
11. Gladding Parkway – From Nicolaus Road to East Avenue
12. Nicolaus Road – From Airport Road to Gladding Parkway
13. First Street – From Fuller Lane to Ian Way
14. Moore Road – From Aviation Boulevard to Joiner Parkway
15. Aviation Boulevard – From Nicolaus Road to Lincoln City Limits
16. Stoneridge Boulevard – From Del Webb Boulevard to Twelve Bridges Drive
17. Del Webb Boulevard
18. Third Street – From Joiner Parkway to Highway 65
19. Fifth Street – From Joiner Parkway to Highway 65
20. Sterling Parkway – From Highway 65 to East Lincoln Parkway
21. Bella Breeze Drive
22. Spring Valley Parkway – From Del Webb Boulevard to Stoneridge Boulevard
23. Sun City Boulevard – From Ferrari Ranch Road to Del Webb Boulevard
24. Ingram Parkway – From Ferrari Ranch Road to Del Webb Boulevard
25. McCourtney Road – From Virginiatown Road to Lincoln City Limits

Future routes outside of City of Lincoln limits but within the sphere of influence:

1. Twelve Bridges Drive – From Highway 65 to Industrial Avenue
2. Aviation Boulevard – From Nicolaus Road to Athens Avenue
3. Highway 65 – From First Street to Industrial Avenue
4. Industrial Avenue – From Highway 65 to Athens Avenue
5. Athens Avenue – From Industrial Avenue to Aviation Boulevard

G. NEV/Golf Cart Parking Facilities
In order to promote NEV travel, NEVs/golf carts should be given preferential parking at all common facilities, including retail centers, commercial centers, parks, medical facilities and educational facilities. Although no industry or local standards exist, we recommend the following minimum number of spaces based on our experience with other Golf Cart communities and plans, and our site review of existing parking stalls for NEVs and golf carts in the City of Lincoln:

- Retail Centers – 2 to 3 spaces (7 feet x 15 feet) per 100,000 square feet plus one additional space for each additional 30,000 square feet.
- Commercial Centers – 2 to 3 spaces (7 feet x 15 feet) per 100,000 square feet plus one additional space for each additional 30,000 square feet
- Private Neighborhood Parks – four to six spaces (7 feet x 15 feet)
- Medical Facilities – Four to six spaces (7 feet x 15 feet)
- Educational Facilities – Six to eight spaces (7 feet x 15 feet)

Note: The number of spaces suggested above, are guidelines. Larger facilities may require more parking spaces.
APPENDIXES
APPENDIX A
STREET CROSS SECTIONS

One-way Class I NEV/Golf Cart Path

Two-way Class I NEV/Golf Cart Path

Collector Street with Class II NEV/Bike Lane

Four Lane Arterial with Class II NEV/Bike Lanes

Residential Street with Class III NEV/Golf Cart Route

Images courtesy of: Fehr & Peers
APPENDIX B

STANDARD SIGNS AND MARKINGS

Figure 1

NOTE:
1. WHITE SIGN WITH BLACK LETTERS

ENGLISH UNITS

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>30</td>
<td>15</td>
<td>.375</td>
<td>2.5</td>
<td>4</td>
<td>2</td>
<td>1.5</td>
</tr>
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CITY OF LINCOLN
DEPARTMENT OF PUBLIC WORKS

CTCDC EXPERIMENTAL STANDARD NEV/BIKE LANE

REVISIONS: DATES: APPROVED: SCALE: NONE

DATE: NOVEMBER 2006 DRAWN BY: MHM

XXX

CITY ENGINEERS DATE
Figure 3

**DETAIL 39EX—NEV/BIKE LANE LINE**

150mm (6in.) WHITE LINE

**NOTES:**

1. NEV Lanes and Combined NEV/BIKE Lanes are to be a minimum of seven (7) feet in width.

2. The stripe is to be placed between the traffic lane and the NEV/BIKE lane.
Figure 4

NOTE:
1. WHITE SIGN WITH BLACK LETTERS

ENGLISH UNITS

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>30</td>
<td>625</td>
<td>.875</td>
<td>5.5</td>
<td>4c</td>
<td>3</td>
<td>2.25</td>
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</tbody>
</table>

CITY OF LINCOLN
DEPARTMENT OF PUBLIC WORKS

CTCDC EXPERIMENTAL STANDARD
NEV'S PROHIBITED BEYOND THIS POINT

REVISIONS: DATES: APPROVED:

SCALE: NONE
DATE: NOVEMBER 2005
DRAWN BY: MHM

CITY ENGINEER DATE

XXX
Figure 5

NOTE:
1. GREEN SIGN WITH WHITE LETTERS.

CITY OF LINCOLN
DEPARTMENT OF PUBLIC WORKS

CTCDC EXPERIMENTAL STANDARD
NEV ROUTE

REVISIONS: DATES: APPROVED:

SCALE: NONE
DATE: NOVEMBER 2005
DRAWN BY: MHM

XXX
APPENDIX C

PARKING AND CHARGING STATION STANDARDS

Figure 1

NOTES:

1. WHERE LIGHTS ARE CONTROLLED BY REMOTE LIGHTING CONTACTORS:

a. INSTALL ONE 15A/1P CIRCUIT BREAKER IN EXISTING LIGHTING PEDESTAL FOR EACH RECEPTACLE (TOTAL 4).

b. PULL 2#12 & #12 GND FROM PEDESTAL TO LIGHT POLE IN EXISTING CONDUIT.

c. MOUNT RED PHENOLIC NAMEPLATE TO EACH RECEPTACLE COVER READING "RECEPTACLE POWERED FROM FOREIGN SOURCE" AND LABEL DEVICE COVER WITH PANELBOARD NAME AND CIRCUIT NUMBER.

CITY OF LINCOLN
DEPARTMENT OF PUBLIC WORKS

NEV CHARGING STATION DETAIL

SCALE: NONE
DATE: NOVEMBER 2005
DRAWN BY: ATEEM

REVISIONS: | DATES: | APPROVED: | CITY ENGINEER | DATE |
--- | --- | --- | --- | ---
| | | | | |
Figure 3

- NEV CHARGING STATION LOCATION 1—4PLEX
  CHARGING STATION FOR EVERY 8 SPACES.

- LOCATE CHARGING STATION(S) NEAR CENTER
  OF STALLS AT NORMAL LIGHT POLE LOCATIONS

NUMBER OF SPACES:
- RETAIL & COMMERCIAL: MINIMUM 2 SPACES
  FOR THE FIRST 10,000 SQUARE FEET OF
  BUILDING AREA PLUS ONE ADDITIONAL SPACE
  FOR EACH ADDITIONAL 6,000 SQUARE FEET.
- MEDICAL FACILITIES: MINIMUM 4 SPACES
- EDUCATIONAL FACILITIES: MINIMUM 8 SPACES
- NEIGHBORHOOD PARKS: MINIMUM 4 SPACES
APPENDIX D

ASSEMBLY BILL NO. 2353

Assembly Bill No. 2353

CHAPTER 422

An act to add and repeal Chapter 7 (commencing with Section 1963) of Division 2.5 of the Streets and Highways Code, and to amend Sections 385.5, 21250, 21251, and 21260 of the Vehicle Code, relating to neighborhood electric vehicles.

[Approved by Governor September 9, 2004. Filed with Secretary of State September 9, 2004.]

LEGISLATIVE COUNSEL’S DIGEST

AB 2353, Leslie. 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 on the ground 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 an unladen weight of 1800 pounds or less. 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.

This bill would authorize, until January 1, 2009, the City of Lincoln and the City of Rocklin in the County of Placer to establish a neighborhood electric vehicle (NEV) transportation plan subject to the same review process established for a golf cart transportation plan. The bill would define “neighborhood electric vehicle” for these purposes to have the same meaning as the above definition of “low-speed vehicle.” The bill, among other things, would provide for the plan to authorize the use of state highways by NEVs under certain conditions. The bill would require a report to the Legislature by January 1, 2008. The bill would enact other related provisions. Because the bill would revise the definition of a 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.
Ch. 422 — 2 —

Statutory provisions establish procedures for making that reimbursement.
This bill would provide that no reimbursement is required by this act for a specified reason.

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

SECTION 1. Chapter 7 (commencing with Section 1963) is added to Division 2.5 of the Streets and Highways Code, to read:

CHAPTER 7. NEIGHBORHOOD ELECTRIC VEHICLE TRANSPORTATION PLAN

1963. It is the intent of the Legislature, in enacting this chapter, to authorize the City of Lincoln and the City of Rocklin in the County of Placer to establish a neighborhood electric vehicle (NEV) transportation plan for a plan area in the city. It is the further intent of the Legislature that this 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. It is the intent of the Legislature, in enacting this chapter, to encourage discussions between the Legislature, the Department of Motor Vehicles, and the California Highway Patrol regarding the adoption of a new classification for licensing motorists who use neighborhood electric vehicles.

1963.1. The following definitions apply to this chapter:
(a) “Plan area” means that territory under the jurisdiction of the City of Lincoln or the City of Rocklin designated by the city for a NEV transportation plan, including the privately owned land of any owner that consents to its inclusion in the plan.
(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) “Speed-modified golf cart” means a golf cart that is modified to meet the safety requirements of Section 571.500 of Title 49 of the Code of Federal Regulations.

1963.2. (a) The City of Lincoln and the City of Rocklin may, by ordinance or resolution, adopt a NEV transportation plan.
(b) The transportation plan shall have received a prior review and the comments of the appropriate transportation planning agency designated under subdivision (a) or (b) of Section 29532 of the Government Code and any agency having traffic law enforcement responsibilities in the City of Lincoln or the City of Rocklin.

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

1963.3. The transportation plan shall include, but is not limited to, all of the following elements:

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

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

(c) Citizens and community involvement in planning.

(d) Flexibility and coordination with long-range transportation planning.

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

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

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

(h) Provisions for NEV electrical charging stations.

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

   1. Class I NEV routes provide for a completely separate right-of-way for the use of NEVs.
   2. Class II NEV routes provide for a separate striped lane adjacent to roadways with speed limits of 55 miles per hour or less.
   3. Class III NEV routes provide for shared use by NEVs with conventional vehicle traffic on streets with a posted speed limit of 35 miles per hour or less.

1963.4. If the City of Lincoln or the City of Rocklin adopts a NEV transportation plan, it shall do both of the following:

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

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

1963.5. If the City of Lincoln or the City of Rocklin adopts a NEV transportation plan, each city may do the following:

(a) Acquire, by dedication, purchase, or condemnation, real property, including easements or rights-of-way, to establish NEV lanes.

(b) Establish a NEV transportation plan as authorized by this chapter.

1963.6. If the City of Lincoln or the City of Rocklin adopts a NEV transportation plan, each city shall also adopt all of the following as part of the plan:

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

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

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

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

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

1963.7. (a) If the City of Lincoln or the City of Rocklin adopts a NEV transportation plan pursuant to this chapter, the cities shall jointly submit a report to the Legislature on or before January 1, 2008, in consultation with the Department of Transportation, the Department of the California Highway Patrol, and local law enforcement agencies.

(b) The report shall include all of the following:
(1) A description of all NEV transportation plans and their elements that have been authorized up to that time.

(2) An evaluation of the effectiveness of the NEV transportation plans, including their impact on traffic flows and safety.

(3) A recommendation as to whether this chapter should be terminated, continued in existence applicable solely to the City of Lincoln and the City of Rocklin in the County of Placer, or expanded statewide.

1963.8. This chapter shall remain in effect only until January 1, 2009, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2009, deletes or extends that date.

SEC. 2. Section 385.5 of the Vehicle Code is amended to read:

385.5. A “low-speed vehicle” is a motor vehicle, other than a motor truck, having four wheels on the ground and an unladen weight of 1,800 pounds or less, that is capable of propelling itself at a minimum speed of 20 miles per hour and a maximum speed of 25 miles per hour, on a paved level surface. For the purposes of this section, a “low-speed vehicle” is not a golf cart, except when operated pursuant to Section 21115 or 21115.1. A “low-speed vehicle” is also known as a “neighborhood electric vehicle.”

SEC. 3. Section 21250 of the Vehicle Code is amended to read:

21250. For the purposes of this article, a low-speed vehicle means a vehicle as defined in Section 385.5. A “low-speed vehicle” is also known as a “neighborhood electric vehicle.”

SEC. 4. Section 21251 of the Vehicle Code is amended to read:

21251. Except as provided in Sections 1963 to 1963.8, inclusive, of the Streets and Highways Code, and Sections 4023, 21115, and 21115.1, a low-speed vehicle is subject to all the provisions applicable to a motor vehicle, and the driver of a low-speed vehicle is subject to all the provisions applicable to the driver of a motor vehicle or other vehicle, when applicable, by this code or any other code, with the exception of those provisions which, by their very nature, can have no application.

SEC. 5. Section 21260 of the Vehicle Code is amended to read:

21260. (a) Except as provided in paragraph (1) of subdivision (b), or in an area where a neighborhood electric vehicle transportation plan has been adopted pursuant to Chapter 7 (commencing with Section 1963) of Division 2.5 of the Streets and Highways Code, the operator of a low-speed vehicle shall not operate the vehicle on any roadway with a speed limit in excess of 35 miles per hour.

(b) (1) The operator of a low-speed vehicle may cross a roadway with a speed limit in excess of 35 miles per hour if the crossing begins and ends on a roadway with a speed limit of 35 miles per hour or less and occurs at an intersection of approximately 90 degrees.
(2) Notwithstanding paragraph (1), the operator of a low-speed vehicle shall not 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 by a low-speed vehicle.

SEC. 6. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.
## APPENDIX E

### CTCDC APPROVAL MINUTES

**MINUTES**

**CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC) MEETING**

Sacramento, July 28, 2005

The second CTCDC meeting of year 2005 was held in Sacramento, on July 28, 2005.

Chairman John Fisher opened the meeting at 9:10 a.m. with the introduction of Committee Members and guests. Chairman Fisher thanked Caltrans for hosting the meeting. The following Members, alternates and guests were in attendance:

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<thead>
<tr>
<th>ATTENDANCE</th>
<th>ORGANIZATION</th>
<th>TELEPHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members (Voting)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Fisher</td>
<td>League of CA Cities</td>
<td>(213) 972-8424</td>
</tr>
<tr>
<td>Chairman</td>
<td>City of Los Angeles</td>
<td></td>
</tr>
<tr>
<td>Farhad Mansourian</td>
<td>CA State Association of Counties</td>
<td>(415) 499-6570</td>
</tr>
<tr>
<td>Vice Chairman</td>
<td>Marin County</td>
<td></td>
</tr>
<tr>
<td>Gerry Meis</td>
<td>Caltrans</td>
<td>(916) 654-4551</td>
</tr>
<tr>
<td>Lenley Duncan</td>
<td>CHP</td>
<td>(916) 657-7222</td>
</tr>
<tr>
<td>Ed von Borstel</td>
<td>League of CA Cities</td>
<td>(209) 577-5266</td>
</tr>
<tr>
<td></td>
<td>City of Modesto</td>
<td></td>
</tr>
<tr>
<td>Merry Banks</td>
<td>California State Automobile Association</td>
<td>(415) 241-8904</td>
</tr>
<tr>
<td>Jacob Babico</td>
<td>CA State Association of Counties</td>
<td>(909) 387-8186</td>
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<tr>
<td></td>
<td>San Bernardino County</td>
<td></td>
</tr>
<tr>
<td>Hamid Bahadori</td>
<td>Auto Club of Southern California</td>
<td>(714) 885-2326</td>
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<td>Gain Aggarwal</td>
<td>League of CA Cities</td>
<td>(707) 449-5349</td>
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<td></td>
<td>City of Vacaville</td>
<td></td>
</tr>
<tr>
<td>ATTENDEES</td>
<td>ORGANIZATION</td>
<td>TELEPHONE/E-Mail</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Matt Schmitz</td>
<td>FHWA</td>
<td><a href="mailto:matthew.schmitz@fhwa.dot.gov">matthew.schmitz@fhwa.dot.gov</a></td>
</tr>
<tr>
<td>Kent Milton</td>
<td>CHP Head Quarter</td>
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</tr>
<tr>
<td>Bret Goss</td>
<td>FCF Inc.</td>
<td><a href="mailto:Bret@FirstCallFlagging.com">Bret@FirstCallFlagging.com</a></td>
</tr>
<tr>
<td>Steve Ainsworth</td>
<td>City of Lincoln</td>
<td><a href="mailto:SAINSWORTH@MICHMENGR.COM">SAINSWORTH@MICHMENGR.COM</a></td>
</tr>
<tr>
<td>Chad Dornsife</td>
<td>Highway Safety Group</td>
<td><a href="mailto:cdornsife@highwaysafety.us">cdornsife@highwaysafety.us</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(858) 675-1926</td>
</tr>
<tr>
<td>Richard Haggstrom</td>
<td>Caltrans</td>
<td><a href="mailto:richard_haggstrom@dot.ca.gov">richard_haggstrom@dot.ca.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(916) 654-6600</td>
</tr>
<tr>
<td>Walter Laabs</td>
<td>City of Santa Rosa</td>
<td><a href="mailto:wlaabs@srcity.org">wlaabs@srcity.org</a></td>
</tr>
<tr>
<td>Keith Lee</td>
<td>LA County, DPW</td>
<td><a href="mailto:klee@ladpw.org">klee@ladpw.org</a></td>
</tr>
<tr>
<td>Dwight Ku</td>
<td>CSAA</td>
<td><a href="mailto:DWIGHT-KU@CSAA.com">DWIGHT-KU@CSAA.com</a></td>
</tr>
<tr>
<td>Joe Jeffrey</td>
<td>Road-Tech Safety</td>
<td><a href="mailto:joe@roadtech.com">joe@roadtech.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(530) 676-7797</td>
</tr>
<tr>
<td>Don Howe</td>
<td>Caltrans</td>
<td><a href="mailto:dhowe@dot.ca.gov">dhowe@dot.ca.gov</a></td>
</tr>
<tr>
<td>Ken Kochevar</td>
<td>FHWA</td>
<td><a href="mailto:KenKochevar@fhwa.dot.gov">KenKochevar@fhwa.dot.gov</a></td>
</tr>
<tr>
<td>Nancy Dean</td>
<td>National Weather Service</td>
<td><a href="mailto:nancy.dean@noaa.gov">nancy.dean@noaa.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(707) 443-5610 x222</td>
</tr>
<tr>
<td>Barb Alberson</td>
<td>Co Dept. of Health Services</td>
<td><a href="mailto:barberso@dhs.ca.gov">barberso@dhs.ca.gov</a></td>
</tr>
<tr>
<td>Ginny Mecham</td>
<td>CHP</td>
<td><a href="mailto:Gmecham@chp.ca.gov">Gmecham@chp.ca.gov</a></td>
</tr>
<tr>
<td>Meriko Hoshida</td>
<td>CHP</td>
<td><a href="mailto:mhoshida@chp.ca.gov">mhoshida@chp.ca.gov</a></td>
</tr>
<tr>
<td>Roger M. Bazeley</td>
<td>SF PTA</td>
<td><a href="mailto:GAZ3leg@designstrategy-usa.com">GAZ3leg@designstrategy-usa.com</a></td>
</tr>
<tr>
<td>Craig A. Copelan</td>
<td>Caltrans</td>
<td><a href="mailto:craig.copelan@dot.ca.gov">craig.copelan@dot.ca.gov</a></td>
</tr>
<tr>
<td>Carl Walker</td>
<td>City of Lincoln</td>
<td><a href="mailto:cwalker@ci.lincoln.ca.us">cwalker@ci.lincoln.ca.us</a></td>
</tr>
<tr>
<td>Jesse Bhullar</td>
<td>Caltrans</td>
<td><a href="mailto:jesse-bhullar@dot.ca.gov">jesse-bhullar@dot.ca.gov</a></td>
</tr>
<tr>
<td>Ricardo Olea</td>
<td>City of San Francisco</td>
<td><a href="mailto:ricardo.olea@sfgov.org">ricardo.olea@sfgov.org</a></td>
</tr>
<tr>
<td>Bond M. Yee</td>
<td>Caltrans</td>
<td><a href="mailto:bond.yee@sfgov.org">bond.yee@sfgov.org</a></td>
</tr>
<tr>
<td>Robert Anderson</td>
<td>CSSC</td>
<td><a href="mailto:anderson@statescismic.com">anderson@statescismic.com</a></td>
</tr>
<tr>
<td>Ken Coleman</td>
<td>LA Safe</td>
<td><a href="mailto:colemank@metro.net">colemank@metro.net</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(213) 922-2951</td>
</tr>
<tr>
<td>Ahmad Rastegarpour</td>
<td>CT</td>
<td><a href="mailto:ahmad_rastegarpour@dot.ca.gov">ahmad_rastegarpour@dot.ca.gov</a></td>
</tr>
<tr>
<td>Dennis Anderson</td>
<td>3M</td>
<td><a href="mailto:d-anderson@mmm.com">d-anderson@mmm.com</a></td>
</tr>
<tr>
<td>Tedi Jackson</td>
<td>CSD</td>
<td><a href="mailto:Tjackson@sandiego.gov">Tjackson@sandiego.gov</a></td>
</tr>
<tr>
<td>Mark Stone</td>
<td>City of San Diego</td>
<td><a href="mailto:mstone@sandiego.gov">mstone@sandiego.gov</a></td>
</tr>
<tr>
<td>Kevin Taber</td>
<td>County of Placer</td>
<td><a href="mailto:ktaber@placer.ca.gov">ktaber@placer.ca.gov</a></td>
</tr>
</tbody>
</table>
Proposal for Experimentation Use of a Nonstandard Signage for Neighborhood Electric Vehicles (NEV).

Chairman Fisher asked Gerry Meis to introduce item 05-5 experiment with Signage for Neighborhood Electric Vehicle (NEV) requested by the City of Lincoln.

Gerry introduced Carl Walker, City of Lincoln and asked him to present his experiment proposal to the Committee.

Carl Walker, City of Lincoln, stated that the City of Lincoln and City of Rocklin are 6 months into a five-year pilot program for NEV travel within the city. The five-year trial is a result of AB2353 which became law as of January 1, 2005. Carl explained about NEVs and how they differ from golf carts. NEV is a compact vehicle, one to four passenger vehicles powered by rechargeable batteries and an electric motor. NEVs are classified as a “low speed vehicle” (LSV) under Title 49 C.F.R Part 571.500. Because NEVs are classified as LSVs, they must meet all safety standards such as seat belts, brake lights, rear lights, headlights, mirrors and windshield. NEVs must comply with all the rules and regulations for a motor vehicle as set for in the California Vehicle Code. NEVs must be registered with the State Department of Motor Vehicles and the driver must hold a valid California driver’s license and be insured. NEVs may travel on any street with a posted speed limit of 35 miles per hour or less. NEVs may cross state highways at controlled intersections only. Golf carts are designed to carry golf equipment and not more than two persons, including the driver. Golf carts are not required to possess the safety equipment required of a low speed vehicle and have a top speed 15-mph. State law prohibits use of golf carts on public roadways outside of a “Golf Cart Transportation Plan”.

Carl also pointed out a PowerPoint slide containing the specifications of the NEV. Carl added that the benefits of NEV uses are for short distance at low speeds where traffic, parking and air pollution might be of concern. NEV can travel 150 miles per gallon and it supports local businesses. NEV can reduce personal travel cost and provide mobility for people who cannot drive an automobile. A critical element of the NEV Transportation Plan includes the development of special paving, road markings, signage and striping for NEV travel lanes. Carl added that there are currently no State or Federal standards for NEV lane widths. The City of Lincoln’s goal is to provide a safe NEV lane width without the lane being so wide that it encourages automobile use.

Carl also discussed different alternatives for NEV travel lanes, such as Class I NEV lanes, Class II NEV lanes and Class III NEV routes. Class II NEV lanes would be a portion of public roadways that are designated by signs and pavement markings for NEV travel. Class III NEV routes are mixed with traffic on most streets posted 35 mph or less. Carl also discussed different striping patterns which he shares with the Committee members by a Power Point Presentation. Carl also showed a proposed new symbol for the NEV, however he informed the Committee that the City will approach FHWA for symbol approval. In closing, Carl stated that the State of California would benefit from to the City of Lincoln’s experience in implementing an NEV transportation plan. The City will identify the hurdles that will be encountered during the implementation of the NEV plan.

Chairman Fisher stated that the presentation showed marking and striping in addition to the signage. However the proposal in the agenda packet only talked about signs.

Carl responded that the City does not have the complete package for application submittal.

Farhad Mansourian stated that the proposed signage does not cover under Section 1A.3 which was recommended to include in the California Supplement earlier by the Committee.
Gerry Meis responded no, the earlier recommendation allows addition of date, extra timing, not to create a verbal message sign.

Hamid Bahadori stated that a golf cart is allowed on roadways with 25 mph or less speeds, so why is there a need to create new signs and striping.

Carl responded that the NEV could operate on roadways with speeds up to 35 mph. The purpose of a separate lane is that if a roadway has a speed higher than 35 mph, then the NEV will have their own travel lane.

Hamid asked whether the City would collect data to determine if NEVs are acceptable to travel on roadways having speeds over 35 mph as long as they have their own travel lanes.

Carl responded that AB2353 allows NEVs on roadways with speeds over 35 mph as long as there is proper signage, striping and a separate travel lane.

Chairman Fisher asked about the Vehicle Code allowing the establishment of separate bus lanes, bicycle lanes, then does this legislation allow the development of separate NEV lanes.

Carl responded yes.

Jacob Babico asked about the sign specification shown on page 32 of 60 shows “NEV Lane”, in his opinion the sign should be “NEV Route”.

Carl responded that is correct, it should be “NEV Route”.

Chairman Fisher suggested that “NEV Route” sign should be “White on Green”.

Hamid added that the request is also for authorization of new pattern of striping.

Gerry Meis added that he was not aware if there would be a request for a marking and striping approval.

Chairman Fisher asked any other comments from the audience and from Committee members.

Roger Bazeley stated that if the proposal is proven to be successful, then it could be expanded throughout California.

Motion: Moved by Farhad Mansourian, seconded by John Fisher, to authorize experimentation with the signage package with the change of “NEV Lane” to “NEV Route” with the use of existing striping details available. Experiment will be conducted on Class II NEV Routes.

Motion carried 8-0.

Action: Item approved for experimentation.
"The GEM (Global Electric Motorcar) is manufactured in Fargo, North Dakota and sold by Chrysler dealers. It is a street legal electric vehicle with 3-point seat belts, safety glass windshield, head and tail lights, turn signals, four wheel hydraulic brakes, independent front suspension, 72-volt motor, six 12-volt batteries, approximate driving range is 30 miles on one charge."
GEM Photos courtesy of:
Roger Oldencamp