

## Plug-in Electric Vehicles

# Regional Planning for Public Charging in San Diego

As plug-in electric vehicle (PEV) adoption increases in San Diego region, local and regional governments and public agencies need to develop land use policies and transportation plans that integrate electric vehicle supply equipment (EVSE) into the infrastructure network. Supporting PEVs helps advance local government and public agency efforts to achieve goals for greenhouse gas emission reduction while cutting their fuel use and costs.

### Why plan at all?

- Near-term needs
  - Identify method to best site PEV chargers
  - Use visual tools through GIS mapping
  - Plan for 1,500 publicly accessible chargers
- Long-term goals
  - Select public sites with the most regional benefit
  - Reduce driver range anxiety
  - Develop interregional network
  - Enhance future siting capabilities

### What is the EV Project?

- ECOTality received \$230M funding from Dept. of Energy and partner matches
- Deploying chargers in major cities and metropolitan areas across the U.S.
- Collecting and analyzing data to evaluate EVSE infrastructure
- Identifying lessons learned and establishing streamlined deployment strategies

### What's been done?

#### *San Diego EV Project Stakeholder Advisory Committee (ESAC)*

- Participants: Local governments and public agencies, nonprofits, universities, utilities and private businesses
- Purpose: Provide input to ECOTality on the local context, history and motivation for EV adoption. Determine and rate factors to be used in siting Level 2 and DC fast charging (DCFC) EVSE.
  1. Characteristics of optimal Level 2 EVSE locations:
    - High number of users
    - High frequency of vehicle turnover (stay times of 45 minutes to 3 hours)
    - Significant availability (maximize hours and days of operation)
  2. Characteristics of optimal DCFC locations:
    - High number of users
    - Very high frequency of vehicle turnover (stay times of 5 to 30 minutes)
    - Significant availability
  3. All locations assessed against the land use suitability factor
  4. Weighted factors applied to the master geographic reference areas (MGRAs) and normalized to provide a score for each MGRA
  5. MGRAs mapped and focus placed on the highest scoring areas to identify potential locations for Level 2 EVSE – 3,333 MGRAs were targeted<sup>1</sup>

#### *DC Fast Charging on Transportation Corridors*

The ESAC provided additional guidance on DCFC along transportation corridors and determined that the following specifications should be documented and taken into account in site selections:

- Major transportation corridors are defined as freeways and highways
  1. Interstate Freeways 5, 8, 15 and 805
  2. State Highways 52, 54, 56, 67, 78, 125, 163 and 905
- Approximately half of the transportation corridor DCFCs should be located at very high volume designed interchanges, with the remaining at slightly lower volume designed interchanges
- Consider characteristics of the host site use that match the typical charge times of 5 minutes to 25 minutes, such as a coffee shop, convenience store or other such businesses
- Spacing of DCFC should consider the potential of additional travel distance (up to 80 miles in 30 minutes)

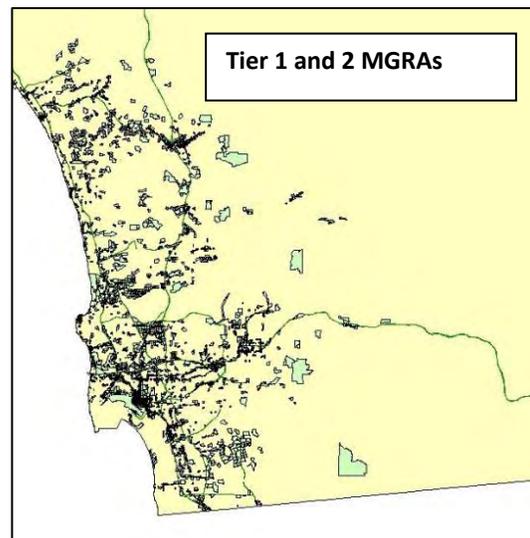
- DCFC spacing should include locations on the periphery of the San Diego EV Project boundary. In addition, DCFCs should be deployed 30–50 miles beyond the boundary along the same transportation corridors.

### EV Project Installations

- Installations<sup>1</sup>
  - April 2011–May 2013: 435 nonresidential AC Level 2 EVSE units including 321 publicly accessible at 121 sites and 114 workplace/fleet EVSE units at 39 sites; 4 DCFC units in the region
- Installations vs Plan<sup>1</sup>
  - Analysis done for 3,333 units within ¼ mile (walking) of the highest scoring MGRAs
  - Several charging units were placed within ¼ mile of more than one MGRA
    - 1,138 (34%) MGRAs served by a deployed publicly accessible EVSE
    - 10 units installed in areas outside a targeted MGRA (not within ¼ mile).
    - 3 units installed far from the nearest MGRA, serving as a means to extend trips.

### EV Project Conclusions to Date<sup>2</sup>

- Charge events per public EVSE continue to increase
- 74% of all charging events are residential
- 27% of all public charging events are from Car2Go
- 19% of all electricity consumed is from publically accessible Level 2 and DC fast charge events



### What's next?

The EV Project was integral in establishing the region's EVSE infrastructure, however, a number of barriers still challenge the deployment of a complete regional EVSE network, including

- Challenges to implementation?
  - Education
  - Incentives/rebates — money
  - Clear legislative and regulatory direction
  - Better integration into local policies and activities
  - More cohesive infrastructure network — connectivity between regions

We can work to overcome these obstacles by

- Further incorporating EVSE infrastructure into planning and development policies
- Considering PEVs in project design and as standard conditions of approval
- Continuing to coordinate with local, regional and neighboring communities/agencies/jurisdictions to link EVSE infrastructure networks
- Informing state agencies about regional challenges, concerns, considerations and impacts from policy and regulatory developments
- Getting the word out and continuing to educate leadership, community leaders and the public



### Zero-Emission Vehicle (ZEV) Community Readiness Guidebook

The Office of Planning and Research has information about identifying PEV infrastructure needs in communities in its document, *Zero-Emission Vehicles in California: Community Readiness Guidebook*, found at: [http://opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://opr.ca.gov/docs/ZEV_Guidebook.pdf).

<sup>1</sup>The EV Project: *Lessons Learned – The EV MICRO-CLIMATE Deployment Process in San Diego*  
[www.theevproject.com/cms-assets/documents/112390-451046.mcproc-sd.pdf](http://www.theevproject.com/cms-assets/documents/112390-451046.mcproc-sd.pdf)

<sup>2</sup>The EV Project: *Q2 2013 Quarterly Report*  
[www.theevproject.com/cms-assets/documents/127233-901153.q2-2013-rpt.pdf](http://www.theevproject.com/cms-assets/documents/127233-901153.q2-2013-rpt.pdf)