

Clean Cities 2011 EV Community Readiness

Center for the Commercialization of Electric Technologies (CCET)
Texas Triangle Plug-in Electric Vehicle (PEV) Readiness Plan
PI: Milton Holloway, CCET

Neil Kirschner
U.S. Department of Energy
National Energy Technology Laboratory

May 15, 2013

This presentation does not contain any proprietary,
confidential or otherwise restricted information.

Project ID: TI031



- **TIMELINE**

- Start: October 2011
- End: June 2013
- 100% Plan Complete
- Implementation is ongoing

- **BUDGET**

- Total Project Funding:
\$537,000
 - DOE: \$500,000
 - Cost Share: \$537,000
- Funded w/ FY11 & FY12 funds
- \$478,590 spent (96%)
(as of 1/16/13)

- **BARRIERS ADDRESSED**

- Lack of state specific, trustworthy, and reliable consumer information
- High costs of PEV ownership
- Lack of multifamily and workplace charging
- Lack of public charging for BEVs along interstate corridors
- Need for streamlined EVSE permitting

- **PARTNERS**

- ECOtality
- Southwest Research Institute
- Frontier Associates
- Southwestern Economics
- Tuttle Consulting
- Plug-in Texas
- AeroVironment
- Regional Clean Cities Coalitions
- General Motors
- City of San Antonio

Objectives:

- The objective of this project is to create a community based electric vehicle infrastructure readiness plan and implement activities in anticipation of larger electric vehicle deployment efforts in the future. Interlink travel corridors between the five largest cities in Texas and leverage the cooperative efforts of stakeholders in three large metro areas (DFW, Austin/San Antonio, and Houston).

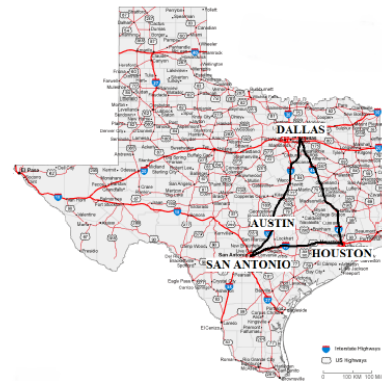


Figure 1-1
The Texas Triangle is the area bounded by the Dallas/Ft. Worth region at the apex, San Antonio and Austin in the southwest and the Houston area in the southeast.

Project Supports VTP Deployment Goals:

- By 2020, to achieve a petroleum reduction of over 2.5 billion gallons per year through voluntary adoption of alternative fuel vehicles and infrastructure.
- To ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- To provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

PHASE I

Task 1.0 – Project Management / Administration

- Manage/monitor task progress, schedule, and financial status; and identify and resolve any potential risks.

Task 2.0 - Develop Plan for Statewide Legislative and Regulatory Initiatives

- Document past and current status of State legislation to support PEVs. Document state agency administrative and regulatory actions necessary to facilitate the integration of a PEV infrastructure along the Texas Triangle. Gather input from other relevant stakeholders and incorporate suggested changes into a report recommending future and legal regulatory initiatives with a focus on those that promote this Texas Triangle PEV Planning effort.

Task 3.0 - Develop Mid-Size City Model Ordinances, Permitting Processes and Training

- Review and summarize available local model ordinances, permitting processes, and training programs that have been recommended and/or are being implemented across the nation. Gather information on/from mid-sized Texas cities and other relevant respondents, from methods such as surveys, analysis, and interviews. Prepare a report that summarizes the results and recommends appropriate measures.

Task 4.0 - Develop Plan for Electric Utility Readiness

- Establish a working group consisting of representatives from electric utilities in the triangle area. Through surveys, interviews, and meetings with the working group, develop a list of utility issues. Document the activities that utilities have taken to facilitate the introduction of PEVS, identify best practices, as well as gaps and needs. Highlight the more-advanced local planning efforts within Texas, describe how needs and issues vary within the Texas Triangle, and provides a roadmap for resolving the key issues.

Task 5.0 - Develop a Plan for the Charging Infrastructure along the Triangle Corridors

- Evaluate and document traffic patterns, road conditions, PEV capabilities in various weather conditions, and other factors to provide adequate transit coverage. Determine private and public entities and their plans for implementing charging stations along the interconnecting highways. Evaluate issues such as type of charging, the business model for siting and billing, the approximate locations for the stations, the likelihood of plan implementation, the dates for commissioning, etc. Develop a plan that considers planned deployments, and addresses gaps in coverage and/or assures timely development of the infrastructure including details of ownership, operation, size and number of charging units, example footprint and plot plan, costs, and other details that will facilitate implementation for either a private or public entity.

Task 6.0 – Design Interactive Consumer Information plan

- Survey or research published PEV information from government, industry, advocacy, and vehicle manufacturer sources and websites to assess the information presently available, which websites are useful for reference, and identify issues or questions for the sources of these existing information resources. Formulate a preliminary structure for a web-based public interactive statewide public program. Identify public and private entities that may have an interest in reviewing and providing relevant insights to improve the preliminary structure. Based on the information gathered, develop a storyboard for a web-based interactive program that primarily addresses the gaps in information that potential PEV buyers are likely to experience or questions which may be more relevant to Texans.

PHASE II

Task 7.0 – Integrate the Team Findings into a Texas Triangle PEV Readiness Report

- Conduct a meeting with team members and the Project Review Committee to present individual plans, and discuss. Individual plans will be revised to reflect the consensus.

Task 8.0 – Host Public Information Forums

- Work with Clean Cities staff in urban areas to develop a schedule and logistical process for hosting public meetings to present the plan and seek both oral and written comments. Post the Plan on both CCET and Clean Cities websites and submit notices to local media of the meetings. Conduct the meetings and record comments. Summarize comments.

Task 9.0 – Prepare Final Texas Triangle PEV Readiness Plan

- Develop and finalize a community based electric vehicle infrastructure readiness plan which contains and addresses, at a minimum, the critical elements 6-10 identified in the Sample Plan Outline, shown as Appendix 1 to Attachment 3 (Federal Assistance Reporting Checklist). Publish the Final Plan and make available to various state agency websites, Clean Cities Coalition Websites, and the CCET website.

*Task 10.0—Detailed Planning and Implementation for PEV fleets*_Develop a plan for the most promising PEV readiness area as determined during the planning process—PEV fleet participation in the electric utility grid. Participants in this task include CCET along with the Electric Reliability Council of Texas (ERCOT), a PEV fleet owner and operator, and one or more PEV electric vehicle supply equipment designer/developers. The product of this task will be a detailed plan for fleet PEV readiness for participation in an Ancillary Service market.

- More than 40 persons on a technical advisory group that met three times to discuss the technical approach in a kickoff meeting, the internal draft in Feb. 2012, and the final recommendations in August 2012
- Convened a group of city managers and elected officials to address the proposed Texas PEV-Friendly Community program
- Public meetings were held in the Houston and Dallas areas to take comments on the list of recommended actions in the Plan. Information booth was available at EPRI's Plug-In 2012 conference in San Antonio.
- Currently engaging ERCOT, a major PEV fleet owner, Oncor Electric Services, and a major energy company in implementing one of this project's recommendations.

- **Year 1**

- **Data gathering**

- Six task teams addressed different issues (e.g. interstate charging infrastructure, electric utility involvement, etc through surveys, and literature review, and interviews with experts in the field.

- **Feedback**

- The teams presented their findings at a mid project review meeting in February 2012 to our technical advisory group, the TAG reviewed and commented upon subsequent versions of the draft and the recommendations section.

- **Completion of Products**

- The Plan was completed in October in three volumes. Volume 1 Summary and Recommendations, Volume 2 Full Report, and Volume 3 Appendices.

- **Outreach of project**

- Exhibits at EPRI's annual Plug In 2012 in San Antonio, public meetings in Dallas/Ft. Worth and Houston areas to present the Plan and get feedback on recommendations.

- **Year 2**

- TN presentations/lesson learned/info sharing

- Currently working on implementing one of the recommendations involving use of fleet charging as an ancillary service to the grid as a means of making PEV fleet ownership more cost effective

- Plug-in Texas is supporting legislative initiatives in the Texas Legislature based in part on the work of the Plan

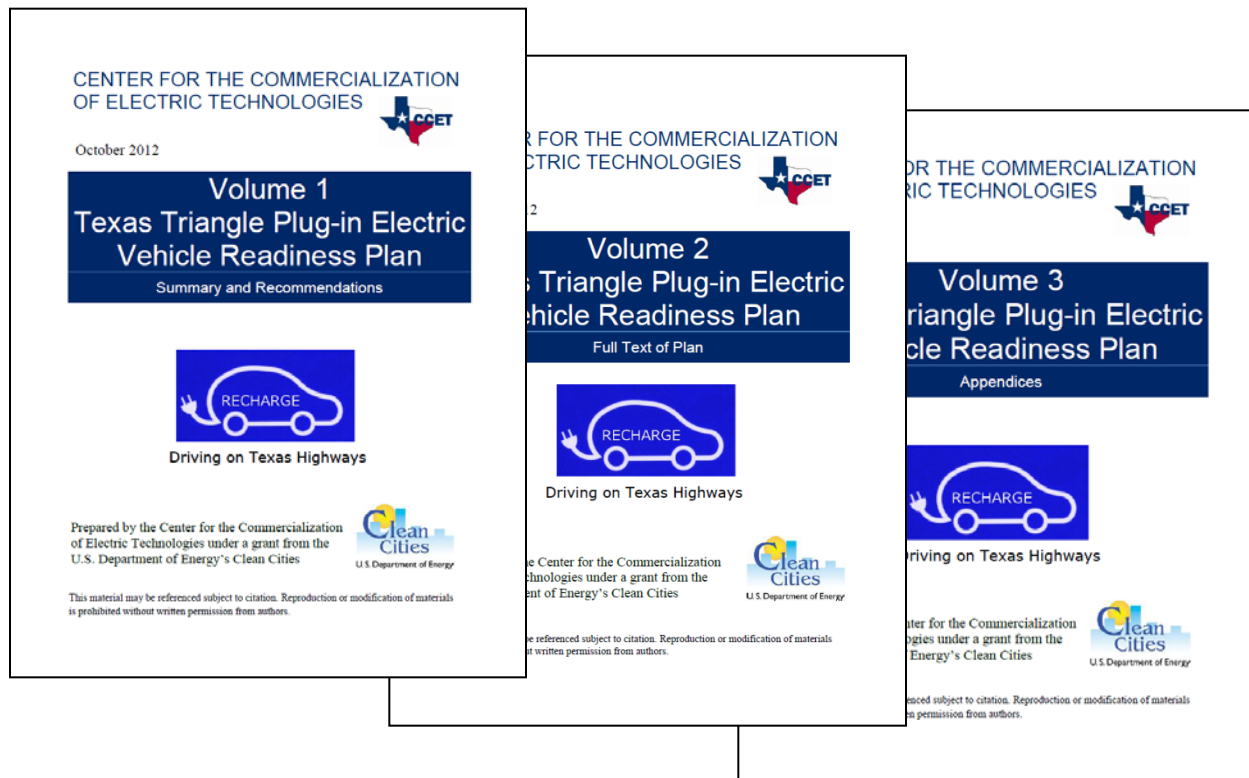
TECHNICAL ACCOMPLISHMENTS

CCET: Clean Cities 2011 EV Community Readiness



Deliverables/Products completed:

- Completed publicly releasable PEV infrastructure readiness plan
- Completed detailed plan for Multi-phase demonstration of PEV Fleets as Ancillary Service to the ERCOT grid.



COLLABORATIONS

CCET: Clean Cities 2011 EV Community Readiness



- ECOtality
- Southwest Research Institute®
- Frontier Associates
- Southwestern Economics
- Tuttle Consulting
- Plug-in Texas
- AeroVironment
- Regional Clean Cities Coalitions
- General Motors
- City of San Antonio

- **This Clean Cities EV Community Readiness Award is in its final stages**
 - **Relevance:**
 - **Advance/enable the deployment and support of of plug-in electric vehicles and EVSE** as a means to reduce U.S. dependence on imported petroleum, increase fuel economy and improve emissions.
 - **Approach:**
 - Develop topic-specific plans, integrate into comprehensive TX Triangle Plan, and provide public forms for implementation
 - **Project Accomplishments/Progress:**
 - Readiness Plan Completed
 - **Collaborations:** Range of relevant organizations involved in target region
- **Efforts will continue through June 2013**

- Major Project Activities for the Next Year
 - Continued Refinement of Readiness Plan
 - continue to coordinate with the three regional Clean Cities groups in Texas that participated in our Texas Triangle Plan including regular conference calls and stakeholder/conference meetings
 - Implementation Activities
 - distributed the Plan to government agencies and bodies that have the authority to implement
 - develop a plan for the use of PEV charging infrastructure and an existing fleet of trucks to add a new revenue stream through participation in an ERCOT ancillary service
 - awaiting private sector engagement of a three phase program that would encourage greater PEV fleet ownership and operation

Clean Cities 2011 EV Community Readiness

City of Austin/Austin Energy: The Texas River Cities Electric Vehicle Initiative
PI: Kurt Stogdill, Austin Energy

Neil Kirschner
U.S. Department of Energy
National Energy Technology Laboratory

May 15, 2013

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Project ID: TI031



- **TIMELINE**

- Start: October 2011
- End: June 2013
- 100% Plan Complete
- Implementation in Process

- **BUDGET**

- Total Project Funding:
\$793,440
 - DOE: \$499,782
 - Cost Share: \$293,658
- Funded w/ FY11 & FY12 funds
- \$583,000 spent (73%)
(as of 1/31/13)

- **BARRIERS ADDRESSED**

- Availability of Alternative Fuel Vehicles & Electric Drive Vehicles
- Availability of Alternative Fuels and Electric Charging Infrastructure
- Consumer Reluctance to Purchase New Technologies
- Lack of Technical Experience with New Fuels and Vehicle Technologies

- **PARTNERS**

- Good Company Associates, Inc.
- SAIC Energy, Environmental & Infrastructure, LLC.
- University of Texas in San Antonio
- CPS Energy
- The University of Texas @ Austin

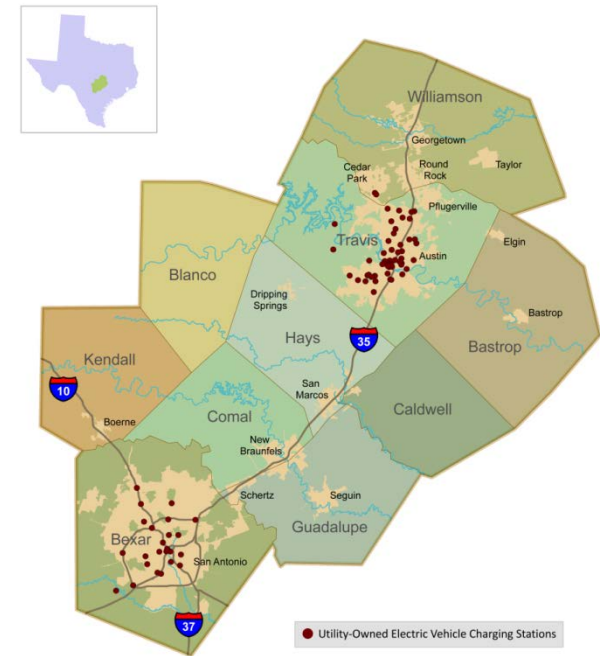
Objectives:

- The objective of this project is to create a community based electric vehicle infrastructure readiness plan and implement activities in anticipation of larger electric vehicle deployment efforts in the future.
- The project will develop a regional/community based electric vehicle infrastructure readiness plan, applying lessons learned and ongoing research. The project plan will include solutions for the technical, operational, and market implementation barriers already identified through Austin Energy's work to date. The Recipient and its partners will establish a framework to support electric vehicle market development within a targeted region of Texas (approximately a 100+ mile region stretching from San Antonio to Georgetown, TX), as well as providing guidance for public power entities across the nation.

Project Supports VTP Deployment Goals:

- By 2020, to achieve a petroleum reduction of over 2.5 billion gallons per year through voluntary adoption of alternative fuel vehicles and infrastructure.
- To ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- To provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

Texas River Cities Plug-in Electric Vehicle Initiative



- Task 1: Analyze market data and conduct new market research on participants in its existing Plug-In Partners Pilot Program. Use research data to project electric vehicle market penetration for private and fleet use.*
- Task 2: Develop needs analysis, typology, and best practice guide for public electric vehicle charging station siting.*
- Task 3: Develop a model that engages the private sector in the provision of electric vehicle charging equipment, products and services, and that addresses the challenges unique to electric markets and regions served by public power.*
- Task 4: Develop model codes and ordinances for parking, building codes, and permitting/inspection, and a timeline for implementing them corridor-wide.*
- Task 5: Develop a marketing and communications plan designed to increase awareness of opportunities and guidelines for electric vehicle charging.*
- Task 6: Address the need for a formalized organization to analyze the opportunities and challenges inherent in preparing the region for electric vehicles. Apply the results of this ongoing analysis to create a regional plan for addressing those opportunities and challenges.*

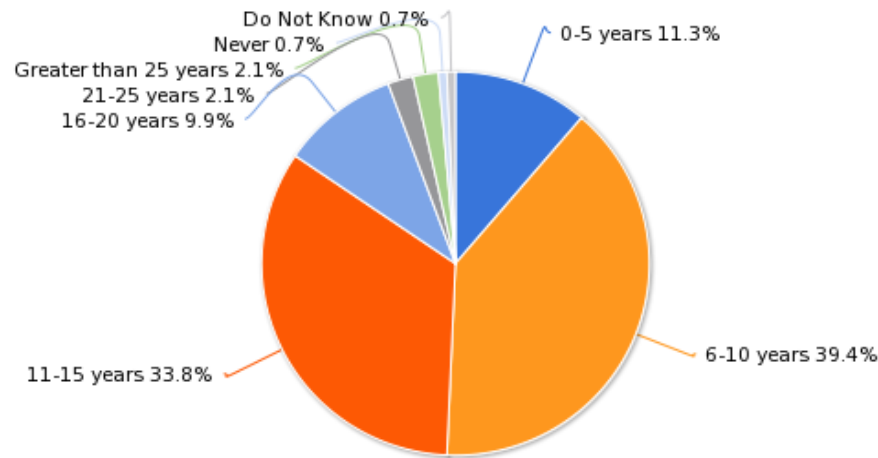
- Task 7: Address the challenges associated with multifamily housing (apartments, condominiums, etc.).*
- Task 8: Address the challenges associated with workplace charging. Identify challenges to workplace charging, and development of opportunities to encourage employees to charge at the workplace.*
- Task 9: Establish the foundation for long-term planning efforts aimed at maximizing operational and financial benefits resulting from integration of charge management and smart grid technologies.*
- Task 10: Develop and finalize a regional/community based electric vehicle infrastructure readiness plan.*
- Task 11: Project management and administration in support of the grant. Manage the cost, schedule and scope of the project and provide status and progress in accordance with the deliverables section of this document.*

- Held 4 general stakeholder meetings across the region
- “Sub-teams” established to work on individual deliverables, review results and recommendations:
 - Model Codes & Ordinances
 - Multi-family & Workplace
 - Business Model
 - Inter-operability
 - Marketing Communications
- Surveys- Austin Energy Market Research and Product Development commissioned surveys of:
 - EV owners
 - Multi-family property managers & residents
 - Employers & employees
 - EV industry business model

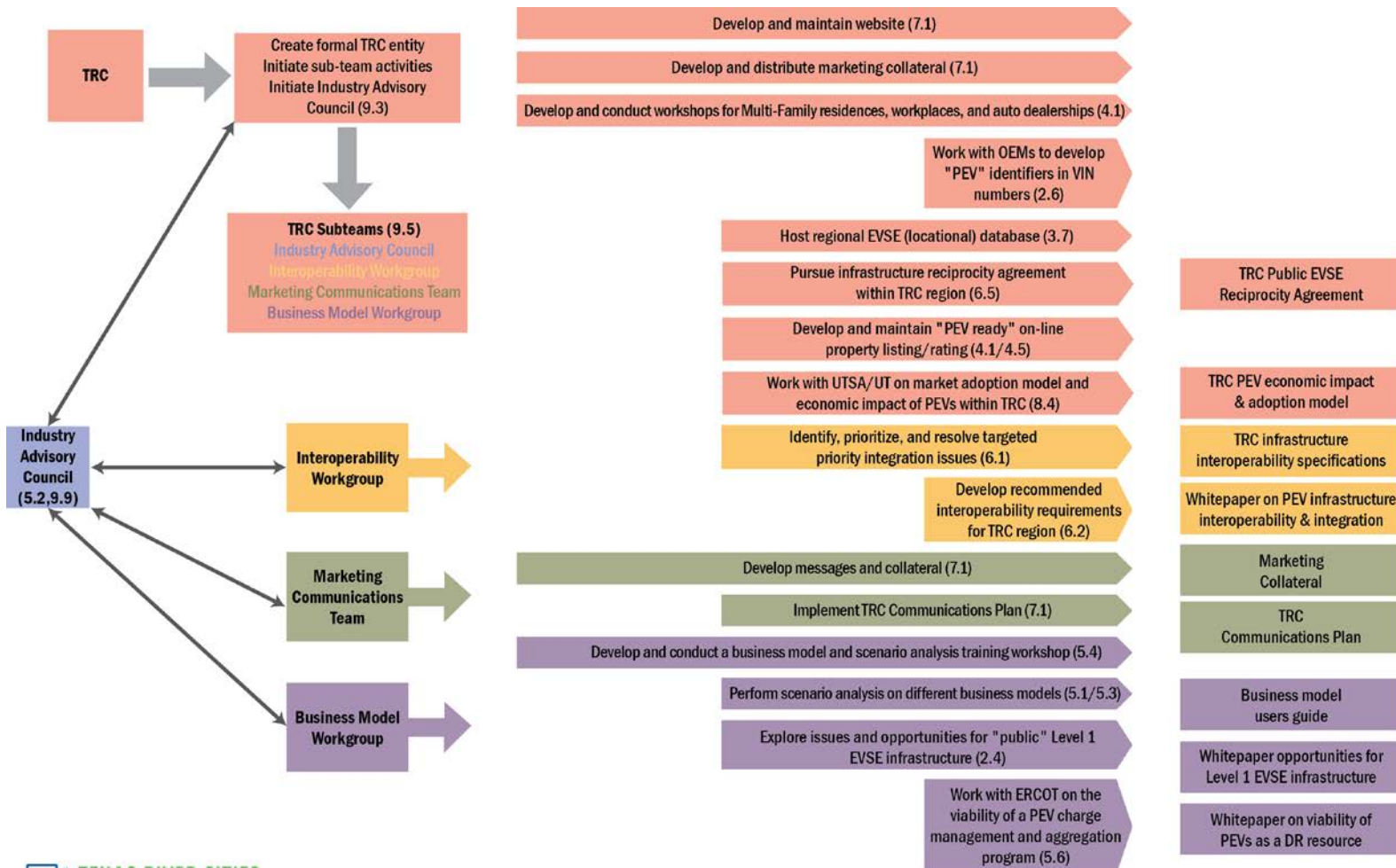
Conducted 5 Surveys- Over 1,000 Responses

Surveys looked at: apartment managers and tenants, employers, EV owners and EV industry stakeholders and examined a diverse set of topics including future industry trends and requirements for EV/industry success

Currently the Plug-In Electric Vehicle industry is just starting to develop.
How long do you think it will take for the industry to fully develop?



Create Recommendations Roadmap



Note: The numbers in parentheses represent the plan recommendation that supports this activity. For example 9.3 is Section 9, Recommendation 3. See Appendix A for a summary list of all recommendations.

- **Year 1**

- Data gathering
 - SAIC, Austin Energy, Surveys through Creative Consumer Research, Stakeholders
- Peer review-
 - Stakeholders provided, ongoing through engagement in sub-teams and dedicated review of proposed drafts
- Completion of Products
 - Regional Plan and Final Report- Oct. 2012
- Outreach of project

- **Year 2**

- TN presentations/lesson learned/info sharing
- Website Development

Deliverables/Products completed

- Texas River Cities Plug-in Electric Vehicle Initiative Regional Plan
 - Needs Analysis, Typology, and Best Practices Guide
 - EVSE Codes, Ordinances, and Permitting Toolkit
 - Workplace and Multifamily Housing Issue Identification
 - EVSE Technology Interoperability Roadmap
 - Communications Plan
 - Projection of PEV Market Penetration for the TRC Region
 - Creation, Administration, Growth of Texas River Cities Initiative
 - Market Research Surveys and Results
- Private EVSE Business Case Model
- Utility EVSE Business Case Model

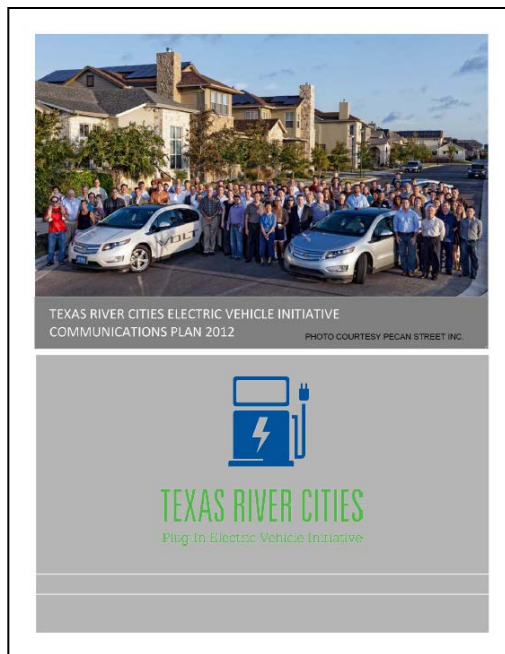


TEXAS RIVER CITIES PLUG-IN ELECTRIC VEHICLE INITIATIVE
REGIONAL PLAN AND FINAL REPORT

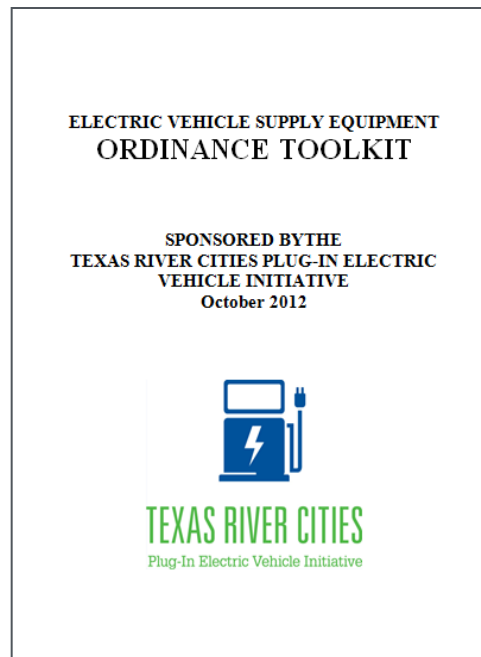


Regional Plan Components

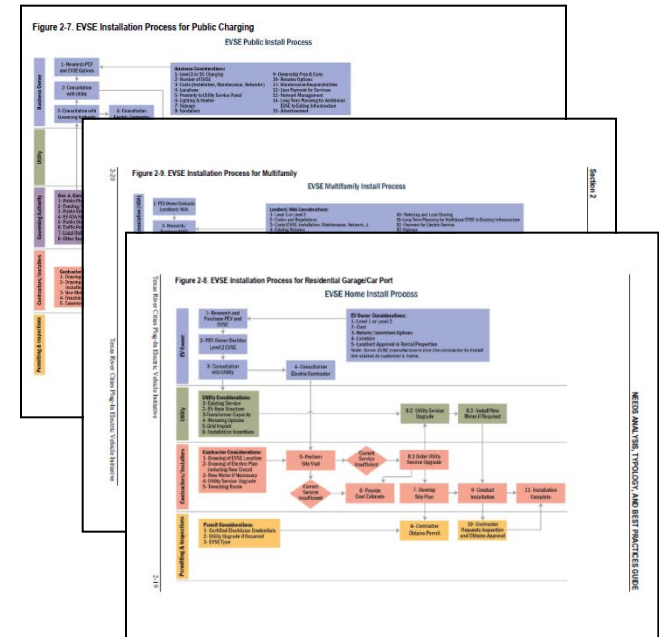
Communications Plan



Ordinance Toolkit



Workplace and Multifamily Housing Issue Identification



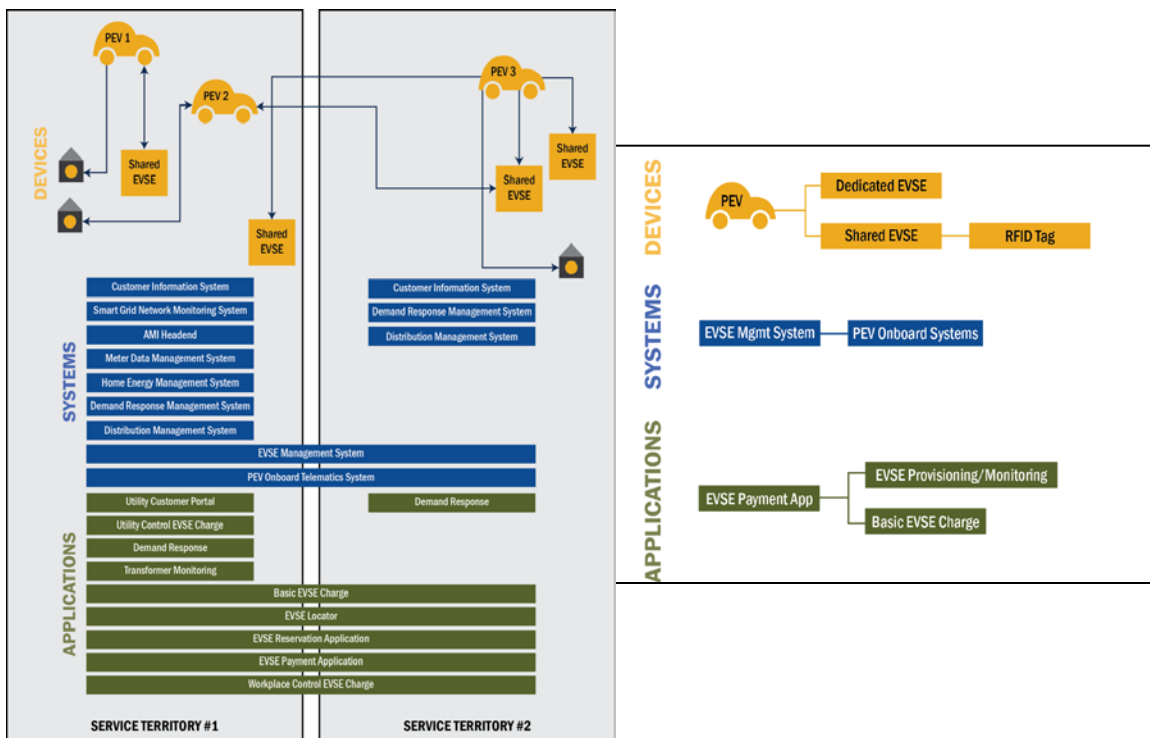
TECHNICAL ACCOMPLISHMENTS (cont.)



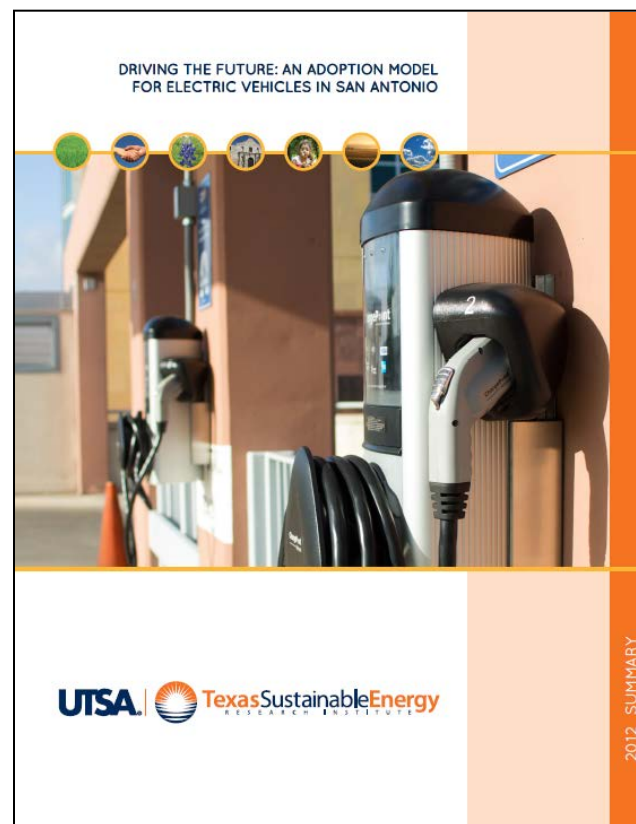
Regional Plan Components

Interoperability Roadmap

Showing the Relationship Between Systems, Devices and Applications (with prioritized short-term integration points)



Adoption Model for EVs in San Antonio



COLLABORATIONS

Austin Energy: Clean Cities 2011 EV Community Readiness



- Alamo Area Council of Governments (AACOG)
- AMLI Residential
- Austin Apartment Association
- Austin Energy
- Austin Technology Incubator's Clean Energy Incubator
- Better Place
- Bluebonnet Electric Cooperative
- Capital Area Council of Governments (CAPCOG)
- Capital Area Metropolitan Planning Organization (CAMPO)
- Center for the Commercialization of Electric Technologies (CCET)
- Central Texas Clean Cities
- ChargePoint (formerly Coulomb Technologies)
- The City of Austin, including the Sustainability Office
- The City of San Antonio, including the Office of Environmental Policy (OEP)
- CPS Energy
- EATON
- ECOTality
- Electric Reliability Council of Texas (ERCOT)
- Environmental Defense Fund (EDF)
- Environment Texas
- EV Autos Texas
- Ford Motor Company
- Gables Apartments
- General Electric (GE)
- General Motors (GM)/Chevrolet
- Greater Austin Chamber of Commerce
- Greater Austin-San Antonio Corridor Council
- GRIDbot
- Gulf States Toyota
- Hubbell Wiring Device-Kellems
- ICF International
- Liberty PlugIns, Inc.
- Mission Verde Alliance
- New Braunfels Chamber of Commerce
- Nissan
- NRG Energy
- Oncor Electric Delivery Company
- Pecan Street, Inc.
- Pedernales Electric Cooperative
- Plug-In Texas
- Potential Difference
- Pvilion
- Southwest Research Institute® (SwRI)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Department of Transportation (TxDOT)
- Texas Military Forces
- Travis County
- Tuttle Consulting
- University of Texas-Austin
- University of Texas-San Antonio (UTSA)
- U.S. Green Building Council (USGBC) - Balcones Chapter
- Verdek
- Via Motors

- This Clean Cities EV Community Readiness Award is in its final stages
 - **Relevance:**
 - **Advance/enable the deployment and support of of plug-in electric vehicles and EVSE** as a means to reduce U.S. dependence on imported petroleum, increase fuel economy and improve emissions.
 - **Approach:**
 - Collaborate, Perform Analysis, Develop User-Specific models, and Develop Final Readiness Plan for Distribution/Implementation
 - **Project Accomplishments/Progress:**
 - Readiness Plan Completed
 - Private and Utility Business Models completed
 - **Collaborations:**
 - Wide range of local and state organizations, utilities, manufacturers, users, and other relevant organizations
- Efforts will continue through June 2013

PROPOSED FUTURE WORK

Austin Energy: Clean Cities 2011 EV Community Readiness



- Major Project Activities for the Next Year
 - Implementation Activities
 - Website Development