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TxDOT Strategic Plan for Hydrogen Vehicles and Fueling Stations

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1. Introduction

The TxDOT Hydrogen Vehicles and Fueling Stations Strategic Panel investigated the situation background (including TxDOT, state of Texas, and national), the state of technology, and implementation drivers, and subsequently provided a near-term plan with a portfolio of medium- to long-term implementation options. The resulting Strategic Plan addresses particular aspects such as viable public and private partnerships and funding mechanisms, comparative feasibility of infrastructure siting, fuel transport and generation, and the full range of economic and social costs and benefits of transitioning to a “hydrogen economy.” The Strategic Plan was structured to enable maximum flexibility and adaptability to accommodate a rapidly changing environment. A panel of eleven individuals, whose collective hydrogen-related research, demonstration, implementation, and commercialization experience totals more than 100 years, developed the comprehensive strategic plan. A prescribed work plan consisting of eight tasks provided the scaffolding necessary to build the plan while allowing for accommodation of input from various backgrounds and for variations in overall plan structure due to on-going findings.

2. Work Plan

The proposed plan of work was managed by Jason Hanlin of the Center for Transportation and the Environment (CTE), directly reporting to The University of Texas at Austin (UT), and consisted of eight discrete tasks that were accomplished over the first eight months of 2006:

T1: Environmental Scan/Needs Assessment

Accomplished over the initial 30-day period, the task involved the collection of quantitative and qualitative information relevant to the development of the Strategic Plan. The intent of this task was to generate a rich contextual field against which the panelists could carefully consider the range of choices and opportunities available to TxDOT to achieve its goals and objectives related to hydrogen vehicle and infrastructure demonstration and program development. This work focused on TxDOT input and state-specific resources available to the project through Texas-based panel members.

T2: Panel Meeting 1

Following the needs assessment/environmental scan, the full panel convened at The University of Texas at Austin and reviewed preliminary findings, discussed plan drivers, established an outline with the critical elements of the plan, and assigned tasks to panelists. This meeting took place March 9-10, and was the first of two full panel meetings in Texas, each spanning a two-day period.

T3: Interim Meeting 1

On April 24, CTE and UT coordinated and presented a status report to TxDOT management. This interim report informed project sponsors of progress to date and provided an opportunity for further feedback and input from TxDOT management.

T4: Draft Plan Preparation

Preparation of the draft outline and structure began during the second month of the project and involved careful assembly and coordination of input into a working document that was inclusive yet coherent and ready for full panel review during the fourth month of the project.

T5: Panel Meeting 2

The full panel again convened in Austin May 1-2 for its second and final full-panel meeting to review the draft plan, revise the structure of the draft plan, and develop consensus on document revisions.

T6: Interim Meeting 2

On June 16, CTE and UT coordinated and presented the second status report to TxDOT management. This interim report informed project sponsors of progress to date and provided an opportunity for further feedback and input from TxDOT management.

T7: Draft Plan Revision

Panelists worked on the final plan revisions throughout the fifth and sixth month of the project and began preparations to submit a final draft for approval by TxDOT.

T8: Final Plan Approval and Submission

During the final 30 days of the project, the TxDOT Strategic Plan for Hydrogen Vehicles and Fueling Stations was prepared and presented to TxDOT officials in both electronic and hard copy formats. In addition, this report documenting the work performed, methods used, and results achieved, is being submitted along with a Project Summary Report.

3. Results

The plan development closely followed the intended work structure. The overall goals and objectives were also met. The plan provides current, near-, and long-term guidance on hydrogen-related issues tailored to the needs and attributes of TxDOT. The plan also includes recommendations for its efficient and effective implementation by TxDOT. The plan has succeeded in remaining flexible and open to change via a portfolio of implementation options that encompass a wide range of costs and benefits. Further, the plan recommends and allows for continued monitoring and development. The plan was completed on-time and on-budget. Note that the original plan development timeframe called for a six-month implementation, but was extended to a mutually agreeable eight months out of convenience rather than necessity.

Conclusions and recommendations resulting from the strategic planning process are focused on a variety of important issues including, but not necessarily limited to, the following items. As suggested in the project proposal, the list of the areas and issues addressed by the Strategic Plan include:

- Pros/cons of a hydrogen-based economy, including both material and social costs and benefits considered in local, state, national, and even international contexts
- Existing and proposed initiatives related to the emergence of a hydrogen-based vehicle and fueling infrastructure system in the state of Texas
- Standard, codes, and safety issues related to that system
- Types and siting considerations of fueling stations, including issues of fuel transport and onsite extraction methods
- Public education and acceptance of hydrogen as a mobile and stationary source fuel
- Opportunities for public-private partnerships, particularly as they impact the future funding of demonstration and implementation projects
- The attraction and cultivation of private sector leadership and industry collaboration to help facilitate and fund technological advancements and promote legislative support
- Quantitative measurement and evaluation of environmental impacts of the transition to hydrogen as a fuel
- Factors of organizational significance for TxDOT's internal consideration

In this way, the Strategic Plan ultimately serves to inform TxDOT, its partners, and stakeholders of the current, near-term, and long-term applicability of hydrogen to the department's operation and mission.