

## State of California Personal Rapid Transit Pilot Demonstration Program

The undersigned urge the State of California to provide funding for a Personal Rapid Transit Pilot Demonstration Project to assess greenhouse gas mitigation effectiveness, the viability of expanded deployments to improve public transit service, and the potential for congestion reduction.

Personal rapid transit is a transformational technology that offers a quantum leap in service and performance. In contrast, hybrids and fuel cell vehicles represent derivative solutions that will result in marginal improvements at best. Personal rapid transit (PRT) is not a straight replacement of automobiles, buses or light rail. PRT can operate without streets and highways. PRT alignments need only limited grading and can be built on the sides of mountains using poles of unequal height. From a service perspective, the versatility of PRT is unmatched by either automobiles or public transit as it combines the best features of each mode. In this respect, PRT provides an attractive public transit alternative to automobiles as it offers the same on-demand connectivity and non-stop, point-to-point service characteristics. Compared to other transportation solutions, PRT has the greatest potential to mitigate greenhouse gases (GHG) and other pollutant (NO<sub>x</sub>) impacts through a combination of super energy efficiency and the reduction of auto vehicle miles traveled (VMT).

The commercial development of high performance PRT has the potential to deliver high-speed, solar-powered surface transportation at lower costs and with higher efficiency than existing automobile or public transit technologies. PRT is unique among all other transportation solutions in that it offers a broad and sustainable path to the rapid attainment of key goals that are both a state and national priority: 1) the reduction of greenhouse gas emissions and other pollutants, 2) the elimination of urban congestion, and 3) achieving energy independence.

Because of its flexibility, PRT has the potential to serve all of California as a high-speed intercity surface transportation system moving passengers and packetized freight more efficiently and at lower cost than existing modes. The growth of the PRT industry in California could serve as a jobs and manufacturing engine and develop into a major export industry for the state and the nation. The development of the State of California Personal Rapid Transit Pilot Demonstration Program ("CPRT") serves the mandate of the

Economic Technology Advancement Advisory Committee (ETAAC) formed as directed by the California Global Warming Solutions Act of 2006 to:

*"advise (ARB) on activities that will facilitate investment in and implementation of technological research and development opportunities including, but not limited to, identifying new technologies, research, [and] demonstration projects..."*

In this regard, the funding of a CPRT demonstration project is consistent with ETAAC's draft policy of establishing a "level playing field" where government policy should not attempt to pick technology winners but rather, performance-based programs should be the norm. In this process ETAAC makes a number of recommendations based on the need to help emerging technologies move through demonstration phases to achieve full commercial viability. In this case, the proposed CPRT program would build and demonstrate a commercial PRT system to obtain critical evaluation data and provide the basis for a comparative analysis in a market structure characterized by performance standards and carbon prices. It should be noted that other low and zero carbon transportation options including light, medium and heavy duty plug-in hybrids, dedicated electric vehicles, hydrogen and other advanced fuels have all benefited from significant public and private investment and have all enjoyed a level of demonstration in the United States that PRT has lacked. The ETAAC draft report acknowledges the problem of overlooked solutions when it states:

*"The absence of funding for project demonstrations is a significant impediment to the maturation of new technologies..."*

Demonstrating new approaches like PRT should be considered when the degree of uncertainty associated with better-demonstrated technologies is taken into account. Specifically, plug-in hybrids, dedicated electric vehicles, hydrogen and other advanced fuels have technical and speed of adoption issues that remain unresolved as stated in the ETAAC draft report:

*...the turnover of the automobile fleet is very slow (about 14 years), so introduction [PHEV, etc.] would have to occur quite soon to make a significant difference by 2020. By that time, liquid fuels with much lower carbon intensity than gasoline are also likely to be introduced and the prospects for battery electric vehicles (BEVs) fuel cell electric vehicles (FCEVs)<sup>12</sup> cars are also likely to be better than they are today. It is not clear what combination of all-electric, hydrogen, and advanced liquid fuels will best serve our transportation needs to meet the dramatic reductions in GHG emission by 2050.*

The likelihood of the anticipated technical breakthroughs and performance improvements stated in the draft report remains, however, a judgment supported by reasonable extrapolation but little empirical data. In contrast, the key technology underlying PRT is well understood and proven in other transportation systems. The main challenge for rapid and broad deployment of PRT is the integration of these technologies into scalable systems.

At the very least, the mission of the CPRT project would be to elevate an under-demonstrated technology to a level sufficient for comparative evaluation with other well-demonstrated GHG mitigation technical solutions of uncertain effectiveness. In fact, the technical weakness of various demonstrated alternatives highlights the urgent need to proceed with a CPRT program to ascertain the potential of PRT and provide critical empirical data for near-term and longer range strategic planning.

## **PRT History**

Personal rapid transit technology has been under development for over thirty years. The federal Urban Mass Transit Administration deployed the first and only commercial demonstration system in the United States at West Virginia University in Morgantown, WV in the 1970s. Similar pilot systems were developed in Europe during this period as well. However, with recent European Union support, second generation PRT development has surged with the deployment of demonstration systems at Heathrow Airport in the United Kingdom and Uppsala, Sweden. Despite the success of the Morgantown system in all areas of performance, the federal government provided no further PRT R&D funding and continues to show no inclination to support PRT programs. As a result, the technology of this legacy system has failed to evolve and remains antiquated. However, privately funded next generation, high performance PRT technology is being developed in the United States and continues to make rapid progress. Several university programs are researching PRT power electronics systems that capture solar and wind energy and use today's stationary batteries and fuel cells for storage.

## **Technology Evaluation**

The CPRT process would establish a protocol for critical evaluation and selection of a state-of-the-art PRT technology to be commercially demonstrated in the pilot project.

## **Conclusion**

PRT, unlike all other surface transportation options under consideration, has the highest likelihood of achieving two vital goals of California public policy, the reduction of congestion and greenhouse gases.

First and second generation PRT technologies are proven and demonstrated technical solutions. Next generation systems under development promise substantial performance breakthroughs. PRT is more energy efficient and therefore potentially more effective in reducing GHG than **mobile applications** of battery, fuel cell, hydrogen and other technologies with even more limited histories of commercial deployment. PRT, by contrast, requires only a pilot commercial deployment to integrate proven technologies in an effort to confirm effectiveness and speed the rate of adoption. However, **stationary applications** of today's battery, fuel cell, and other energy storage

technologies should be incorporated into the CPRT to demonstrate a viable off-peak PRT power source.

The demonstration system should test the social aspects of integrating other forms of transportation, including neighborhood electric vehicles, plug-in hybrids and bicycles into their daily commute. Due to its many social benefits, PRT has the highest potential to reduce auto VMT and encourage transit-oriented development by reclaiming unused parking spaces to reverse urban sprawl.

Of all the surface transportation technology options available for consideration, PRT has the fewest number of technological and financial hurdles in meeting CARB goals for GHG reduction in the shortest amount of time.

The state of California has a unique opportunity to jumpstart this critical technology in the United States and become a world leader in advanced transportation solutions.

Signed,

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