ITHACA CARSHARE: CARSHARE IMPLEMENTATION IN A SMALL UPSTATE CITY

During the summer of 2006, Program Opportunity Notice (PON) 1028 was issued to support the development, qualification and/or demonstration of innovative transportation products and systems. This PON was a joint effort of the New York State Department of Transportation (NYSDOT) and the New York State Energy Research and Development Authority (NYSERDA). One of the projects selected for funding was Ithaca Carshare, an early small-city implementation of car sharing.

Carsharing is a membership-based program that allows approved members 24/7 automated access to a fleet of vehicles located in scattered sites, usually in or near dense neighborhoods or employment centers.

Members' driver records are vetted before approval, allowing the Carshare organization to hold auto liability insurance on the entire group as a pool. Use of vehicles is coordinated with a reservation system where members can reserve cars via the web or an automated phone system, on a first come, first serve basis. Access to the cars and records of time of use and mileage, are created and kept using an RFID system with computers in the cars that send information to a central server via text messages and a cell phone modem.

Members pay an application fee, an annual or monthly membership fee, and usage charges (per hour and per mile) only when they reserve and use vehicles. All other expenses, including gas, insurance, maintenance, cleaning, and other costs, are borne by the carshare organization, with members receiving a monthly bill itemized by trip.

Carsharing is particularly suited to short duration trips from locations where the user does not have convenient access to a personal car. For instance, non-SOV (single occupant vehicle) commuters can benefit from carshare vehicles located at employment centers for mid-day errands including doctor visits, or work related errands.

Residents of dense neighborhoods benefit from car sharing because their need for a dedicated private automobile may be infre-
quent. Car sharing can provide the occasional access to a car for shopping trips or other trips not well served by transit, walking, or biking, thereby allowing reduced car ownership by residents of downtowns and other nodes.

Car sharing was first launched in Switzerland in 1987 and in North America in Quebec City in 1993. As of July 2008, there were 33 programs serving 318,838 members with 7,505 vehicles in North America. Most cities with car sharing are large urban areas. Ithaca Carshare is one of the first to explore applying this mode in a small city, in view of the possibilities for other Upstate cities.

Ithaca Carshare's business model includes strong partnerships with Cornell University and Ithaca College, serving both the student and staff populations. Because so many people are able to benefit from Ithaca Carshare vehicles, the City of Ithaca, Cornell University and Ithaca College have all provided parking for carshare vehicles, similar to what is provided for bus stops.

A major hurdle for the project was finding auto liability insurance. The conservatism of the insurance industry coupled with the innovation of this business model proved challenging. After nearly two years struggling with this issue, Ithaca Carshare finally ended up using a connection with another nonprofit carshare outside NYS to secure this insurance.

Cornell and Ithaca College have also purchased memberships in bulk for students and staff, with Cornell tying eligibility for these “free” memberships to participation in their award-winning TDM (transportation demand management) program.

Ithaca Carshare launched with six Nissan Versa hatchbacks located in downtown Ithaca, on the Cornell and Ithaca College campuses, and at EcoVillage at Ithaca (a co-housing community located 2 miles west of Ithaca). In the first three months of operation, Ithaca Carshare has grown to serve 500 members with nine cars and one Toyota Tacoma pickup truck. They have also served as a mentor for several other groups exploring carsharing services in other Upstate cities.

Future plans include outreach to low-income populations in partnership with social service agencies and investigation of the possibility of adding electric or plug-in hybrid vehicles to the fleet.

For additional information on this please contact Joe Tario at jdt@nyserda.org

**FIRST PERPETUAL HOT MIX ASPHALT PAVEMENT IN NEW YORK**

The first hot mix asphalt (HMA) perpetual pavement in New York was built on an existing Portland Cement Concrete pavement of 9 inches thick which wasrubbledized to form a solid foundation. The perpetual pavement section, which is approximately 1640 feet long, is located about 3 miles from Angelica, NY in Region 6 on Interstate 86 east bound and is also instrumented. The new structure is composed of 3 layers of HMA with a total AC thickness of 9 inches. The base or bottom layer, placed on the rubbledized concrete, is 3.5 inches thick, using a 1 inch mix with an asphalt content of 4.4%. The middle layer was built with two lifts of 2 inches each with a total thickness of 4 inches using a 19 mm mix with an asphalt content of 4.7%. Finally, the surface course is 1.5 inches thick using a 9.5 mm mix with an asphalt content of 6.1%. All lifts used a PG 64-22 polymer-modified binder.
Perpetual Pavement is defined as an asphalt concrete pavement that is built to last for 50 years or longer without any maintenance other than occasional replacement of the thin but durable wearing course. This reduces user delays and rehabilitation costs, offsetting the higher initial cost of installation. The removed surface layer can also be recycled, saving material resources. The main focus of the perpetual pavement concept is to eliminate bottom up fatigue cracking while still providing a durable product. When pavements undergo cyclic traffic loading, the bottom layer of the pavement structure becomes fatigued from induced strain, cracks begin to develop at the bottom and then propagate into the upper layers, eventually making their way to the surface. To combat this problem, perpetual pavement uses a mix that is resistant to rutting and thermal cracking to create a pavement designed to be strong enough that traffic-induced strains will remain at or below a threshold value (typically 60-70 με) known as the “endurance limit”, so that cracking of the asphalt will never occur. Perpetual pavement is typically designed in layers using Mechanistic-Empirical (ME) design principles. From surface to base, these layers consist of a thin durable surface course, an intermediate layer, a thick high-modulus asphalt layer, and a fatigue-resistant course which is placed on top of an aggregate base (in this case the rubbilized preexisting PCC pavement) over the subgrade. The top layer absorbs damage due to traffic and environmental factors over the life of the pavement and may be ground off and replaced from time to time to rejuvenate the surface. In this project, the main difference between conventional HMA (control section) and the perpetual pavement was a thicker section of the HMA. The thickness was designed to insure that the endurance limit is never exceeded at the bottom layer of AC pavement. Proper design and preparation of the road foundation is also crucial for the durability of perpetual pavement.

Four Linear Variable Displacement Transducers (LVDTs), two pressure cells (PCs), four thermocouples (TCs), and sixteen strain gauges were placed in the instrumented section. The reference points for the deep LVDTs are located 11 feet below the surface course; the other two shallow LVDTs have their reference point just below the rubbilized concrete. In the base layer, eight strain gauges were installed above the rubbilized concrete placed 2 feet apart from each other. There are two thermocouples above the rubbilized concrete.

The pavement construction process was monitored, and the materials used in the pavement were tested in the laboratory following the mechanistic-empirical pavement design guide (MEPDG) specifications to ascertain material property information. The first falling weight deflectometer testing was conducted on September 9, 2008. In addition, strain, soil pressure, pavement deflection, and pavement temperature were monitored. The data collected will be used to validate the design concept, which is based on control of strain in the fatigue resistance layer. The data will also be used to verify and validate existing pavement design models, such as the MEPDG and the PerRoad computer program.

We would like to recognize the following individuals that were instrumental in the planning, construction and supervision of the first perpetual pavement in New York State: Christopher L. Blades from A. L. Blades and Sons, Inc., Christopher Giles, Regional Construction Engineer, Dave Henry from NYSDOT EIC, Steve Kays from Prudent Engineering, Dr. Shad Sargand and Issam Khoury from Ohio University.

If you have any questions on perpetual pavement or the Mechanistic-Empirical Pavement Design Guide contact Julian Bendaña at jbendana@dot.state.ny.us
HISTORIC ARCHAEOLOGICAL PRESERVATION IN TRANSPORTATION

The joint meeting of the Landscape and Environmental Design Committee (AFB40) and Historic and Archaeological Preservation in Transportation Committee (ADC50) was held in Saratoga Springs, September 7-10, 2008. NYSDOT hosted the meeting, with TRB committee members Nancy Alexander (AFB40) and Linda Harvey-Opiteck (ADC50) from the Office of the Environment serving as meeting co-chairs on behalf of the Department.

This was an unparalleled opportunity for Department staff to participate in a National meeting with the leading thinkers and practitioners in their respective professions from across the country and Europe. Over 120 attendees attended paper sessions on topics covering Historic Bridge Preservation and Management, Innovative Approaches to Public Outreach, Public Private Partnerships in Preservation, Environmental Considerations of Roundabouts, and Historic Road Management and Preservation. Regional and Main Office Staff were well represented as presenters and moderators in paper presentation sessions, and there was also significant NYSDOT participation in the staffed poster session.

Special keynote presentations included: The High Line - Transforming a Former Elevated Railway into a Skybourne Public Park in New York City, and Conversion of the Poughkeepsie-Highland Bridge into a Multi-Use Trail; both were hits with the audience.

Meeting attendees also got a chance to participate in a research topic brainstorming session conducted by the Chairs of the two TRB Committees. One participant noted a more clearly defined understanding of the role of TRB and its relationship to practice. Several of the topics proposed by the diverse group were reflected in recent NCHRP Research Proposals submitted by the TRB Committees.

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