

## Development of Hydrogen Based Power Systems for ITS Applications

There are many remote traffic signals on the road that don't have access to a regular power supply, so they use batteries that need to be changed quite often. A hydrogen fuel cell is an electrochemical device that combines hydrogen and oxygen to produce electricity. It offers clean and high efficiency energy source to circumvent the problems associated with the conventional batteries. However, one major drawback that limits its utility is the use of compressed metal cylinders as a source of hydrogen. Chemical based hydrogen production can provide a very compact and low-pressure storage option for the controlled release of hydrogen gas in large amounts. The hydrogen based fuel cells can also be used as backup power source at critical traffic signals to prevent accidents during power outages. The other possible ITS applications include alternating-traffic signs, directional signals, speed-limit signs, blinkers in series, and warning blinkers etc (**Figure 1**).



The project deals with the development of novel hydrogen storage chemicals, efficient generation of hydrogen and recycling of spent materials. The best chemical would be integrated with fuel cell to construct a prototype power system for ITS and other related applications.