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The Ideal Hydrogen Demonstration Platform

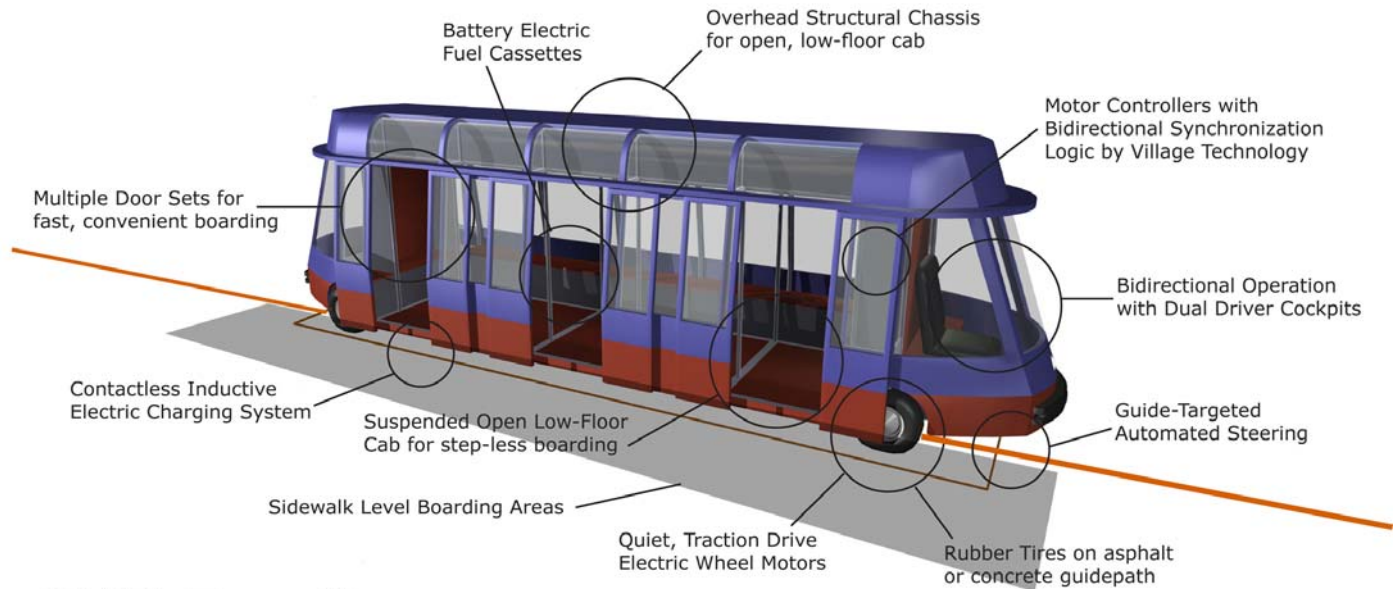
The platforms for hydrogen demonstration projects seem obvious: Put fuel-cells into cars, into trains and buses, trucks and ferry-boats. In other words, put them into all the vehicles that are currently burning hydrocarbons. I would like to suggest, however, that the best platform might be one that demonstrates a lot more than simply a new fuel regime—something that *also* demonstrates a new solution to urban living and sustainable development: the on-grade, bidirectional downtown people-mover.

First of all, what *is* a bidirectional downtown people-mover? It is a practical, affordable, horizontal pedestrian mobility system that can fit into virtually any existing streetscape without eliminating traffic lanes. It uses simple rubber-tired tram-buses. The tram-buses are synchronized to arrive at mutual stop-boarding areas at the same moment, providing a seamless 3 minute headway in both directions along a single, narrow, dedicated guidelane.

Operating along strategic urban corridors, these easy-to-build systems would enable people to get out of their cars sooner, and stay out of them longer. For city dwellers, they would provide the opportunity to stay out of their cars for days at a time!

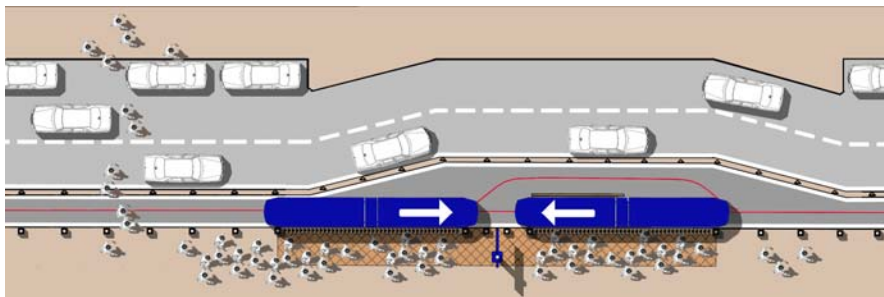
Village Technology has developed and patented the SMRrTRAM Synchronization Logic that will enable these people-movers to operate—and we believe there are five reasons why they could be ideal fuel-cell demonstrators:

1. The battery electric vehicles themselves don't have to have fuel cells on-board, but could be inductively charged with fixed fuel-cell generators at one or more of the stop-boarding areas.



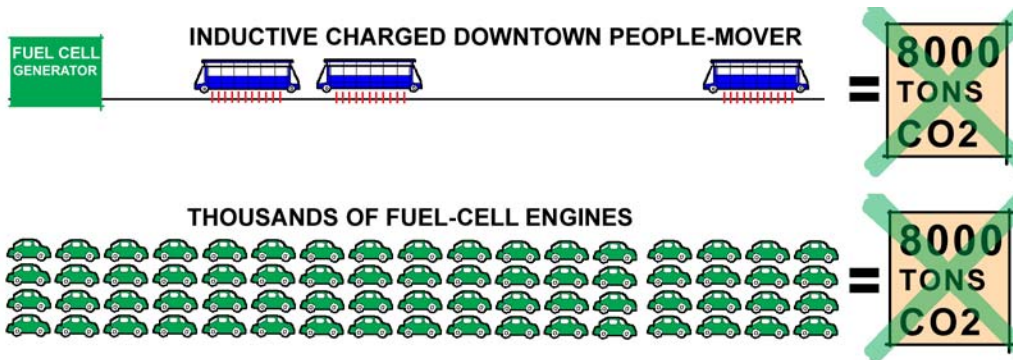
SMRrTram™ Battery-Electric Bus

The bidirectional people-movers, therefore, can be brought on line rapidly, since the on-grade synchronization architecture that makes them possible is relatively easy to retrofit and construct within existing streetscapes.



2. The people-movers would generate a larger carbon-reduction per hydrogen investment dollar than demonstration cars or trucks, or even buses. A single downtown people-mover, for example, could replace several thousand car-trip parking movements per day.

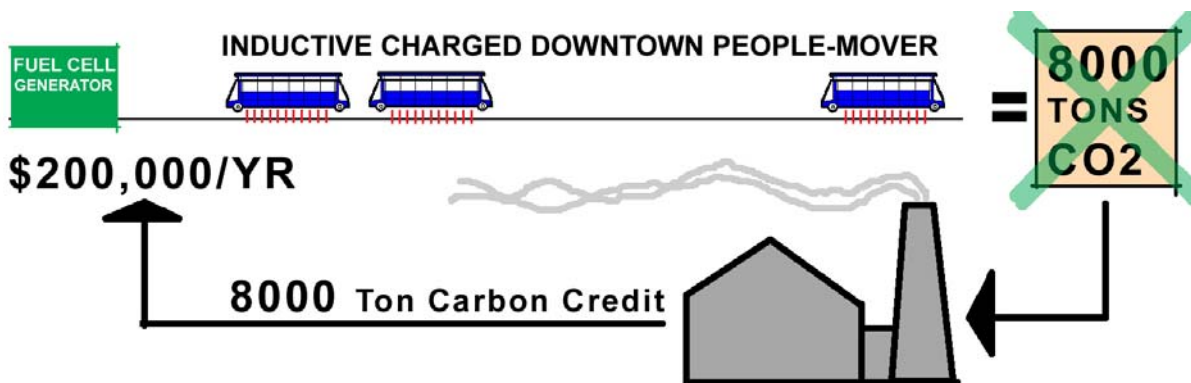
If we estimated that an average car-trip parking movement emits 3 lbs of CO₂, we could generate the following calculus:



A people-mover able to move 5000 people/hr. might operate at an overall 60% capacity. Half those riders might be pedestrians who use the people-mover instead of moving their car. That's equal to 15,000 eliminated car-trips each 10 hour day—or over 8,000 tons of eliminated carbon per year.

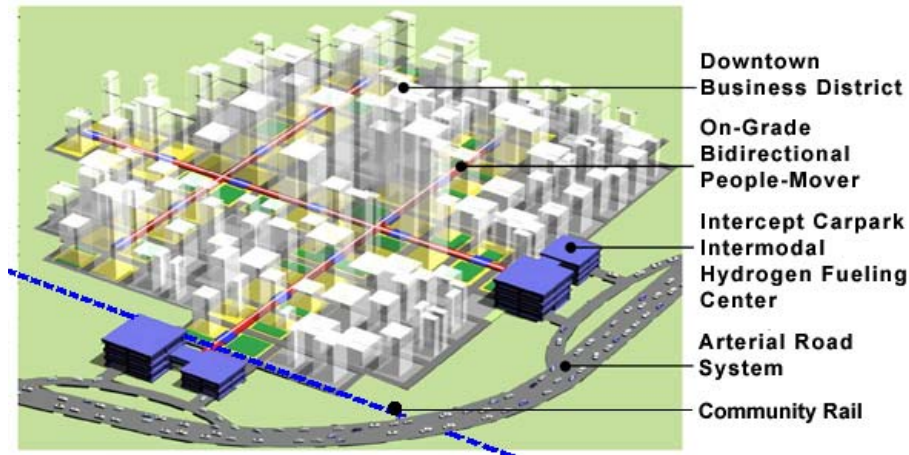
This could be achieved with a few fixed-location hydrogen fuel-cell generators. To achieve the same CO₂ reductions by converting the *cars* to hydrogen would require a separate fuel-cell engine for each of the 15,000 car-trips!

3. Because of the discrete (rather than diffused) nature of the investment, hydrogen powered urban people-movers could readily participate in the evolving international carbon-credit exchange system. Given the current European carbon-credit rate of \$25 per ton, the example people-mover suggested above could attract an exchange investment for over 8,000 tons of CO₂—or over \$200,000 per year. This would amortize a capital investment of over \$2.5 million—enough to partially offset the cost of the fuel-cell components of the system.



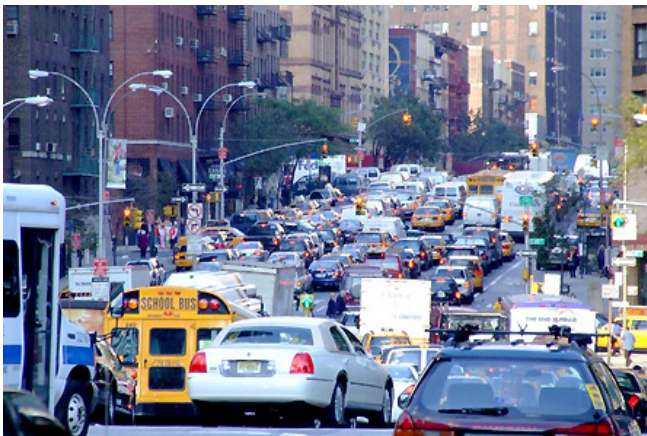
4. On-grade, hydrogen powered people-movers also fit logically into a larger strategy to introduce hydrogen fueling stations for private vehicles into urban areas: Intercept Carparks. Located on the edge of congested business districts—intercept carparks get people out of their cars sooner. It is the people-mover, however, that will make the intercept carpark a feasible and attractive option for drivers.

Since the intercept carpark would be a logical location for the fuel-cell generator, a single hydrogen fueling station investment could power both the people-mover *and* provide a fueling station for private vehicles as they begin to be converted.



People-movers also make the intercept carparks logical sites for other intermodal connections as well—a commuter bus or rail station for example. By focusing initial hydrogen fueling stations at intercept carpark/intermodal sites, a single fueling station investment can serve multiple high-impact public transit modes.

5. Finally, and perhaps most compelling, on-grade urban people-movers can demonstrate that the hydrogen era we are striving to create is about much more than simply replacing carbon-based fuels with hydrogen: it is also about creating new solutions and systems for sustainable development and urban living.



Presently, traffic congestion, parking shortages and an aging population make urban living more and more difficult even as the pressures to urbanize grow stronger. Simply changing fuel regimes would have no impact on these difficulties and stresses. No single innovation could ease the task of urban living and increase its sustainable enjoyment more than empowering pedestrians to move around freely and conveniently in urban settings without having to resort to their cars. Hydrogen powered people-movers of a kind that cities can easily and affordably operate in their existing streetscapes—like SMRrTRAM—could achieve this goal.

Village Technology holds U.S. and Canadian patents for the SMRrTRAM People-Mover Architecture, and is presently looking for development partners. Further information is available at: www.villagetechnology.com

The presenter is design partner with Alt Breeding Schwarz Architects in Annapolis, Maryland—and founder of Village Technology, an urban-solutions think tank.

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