

DAWN OF THE HYDROLLEY

or

“2009: A CHANGE ODYSSEY”

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by Stan Thompson for **HEAT**

Hydrogen **E**conomy **A**dvancement **T**eam

Mooresville/South Iredell Chamber of Commerce

Mooresville, North Carolina

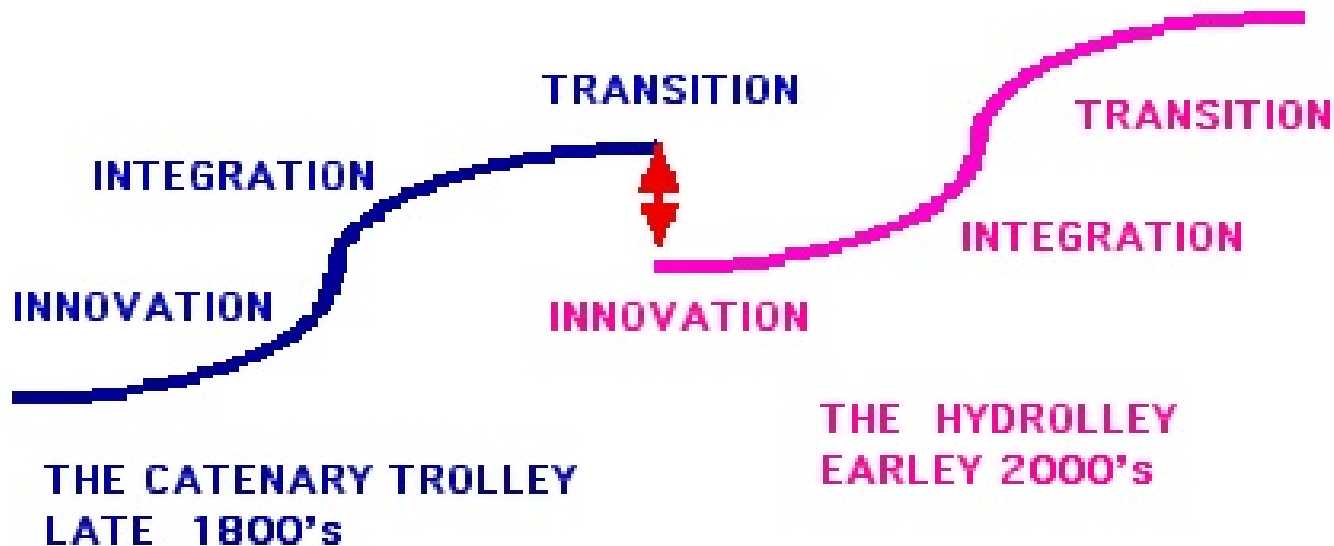
1969...Stanley Kubrick's
film classic,
2001: A Space Odyssey

An illustrative metaphor
for the catenary-to-
hydrolley transition

The “**2001**” movie plot:

- “HAL”—the space ship’s computer—goes haywire and kills all but two of the crew.
- HAL lures astronaut Dave out of the ship in a work “pod” in a hopeless attempt to rescue Frank, his partner. But Dave forgets and leaves his space helmet onboard the ship.
- Dave has to choose between **slowly running out of air** in the pod or regaining the main space ship by **surviving a few seconds in the vacuum of space**.
- *Everything depends on minimizing time he spends in the vacuum!*

LIKE DAVE'S TRIP THROUGH THE VACUUM OF SPACE, THE TROLLEY-TO-HYDROLLEY TRANSITION IS UNAVOIDABLY DANGEROUS AND PAINFUL .



BUT AT SOME POINT, THE RISK OF *INACTION* BECOMES *GREATER* THAN THE RISK OF *INNOVATING*

... THOUGH THE STATUS QUO MAY *SEEM* LESS SCARY.

WHAT'S DRIVING THE CURRENT STREETCAR RENAISSANCE

- 1980: **8** in US ... 2005: **28** ... 2006: **81+** planned!
- the driving hassles of personal cars: fuel cost, A/Q non-attainment, CO₂ emissions, urban congestion
- the infrastructure capital / maintenance and transportation fuel requirements of sprawl
- a new, growing, young, urban-preferring demographic
- a new paradigm: the car as an encumbrance rather than an enabler
- the unavoidable tension between the car and environment

Seattle, Portland, Salem, San Francisco, LA, San Diego, Tucson, Phoenix, Albuquerque, Denver, Colorado Springs, Spokane, Boise, Salt Lake, Sacramento, Austin, Houston, Corpus Christi, Kansas City, St. Louis, Des Moines, Minneapolis, Kenosha, Madison, Omaha, Chicago, Little Rock, Memphis, Dayton, Toledo, Cincinnati, Columbus, Lancaster, Philadelphia, Newark, Providence, Kinston NY, DC, Richmond, Roanoke, Atlanta, Savannah, Birmingham, Miami, Tampa, Grand Rapids, Boston, Lowell, French Lick Indiana, Charlotte, NC.

EXISTING AND PLANNED STREETCAR SYSTEMS: 81 +



COURTESY,
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San Francisco, New Orleans, Philadelphia, Newark, Cleveland, Boston, San Diego, Pittsburgh, San Jose, Sacramento, Portland, LA, Houston, Denver, Salt Lake City, Buffalo, St. Louis, Galveston, Tucson, Seattle, Dallas, Little Rock, Memphis, Tampa, Baltimore, Lowell, Minneapolis, Kenosha

THE HYDROLLEY DIFFERENCE

- *no overhead catenary*—leaves municipal utility plant “buried in peace.” On-board fuel cells eliminate the need:
- *no poles or guys*
- *no transformer substations*
- *no complex grounding*
- *no catenary maintenance labor*
- *but a trackside fueling site is needed*

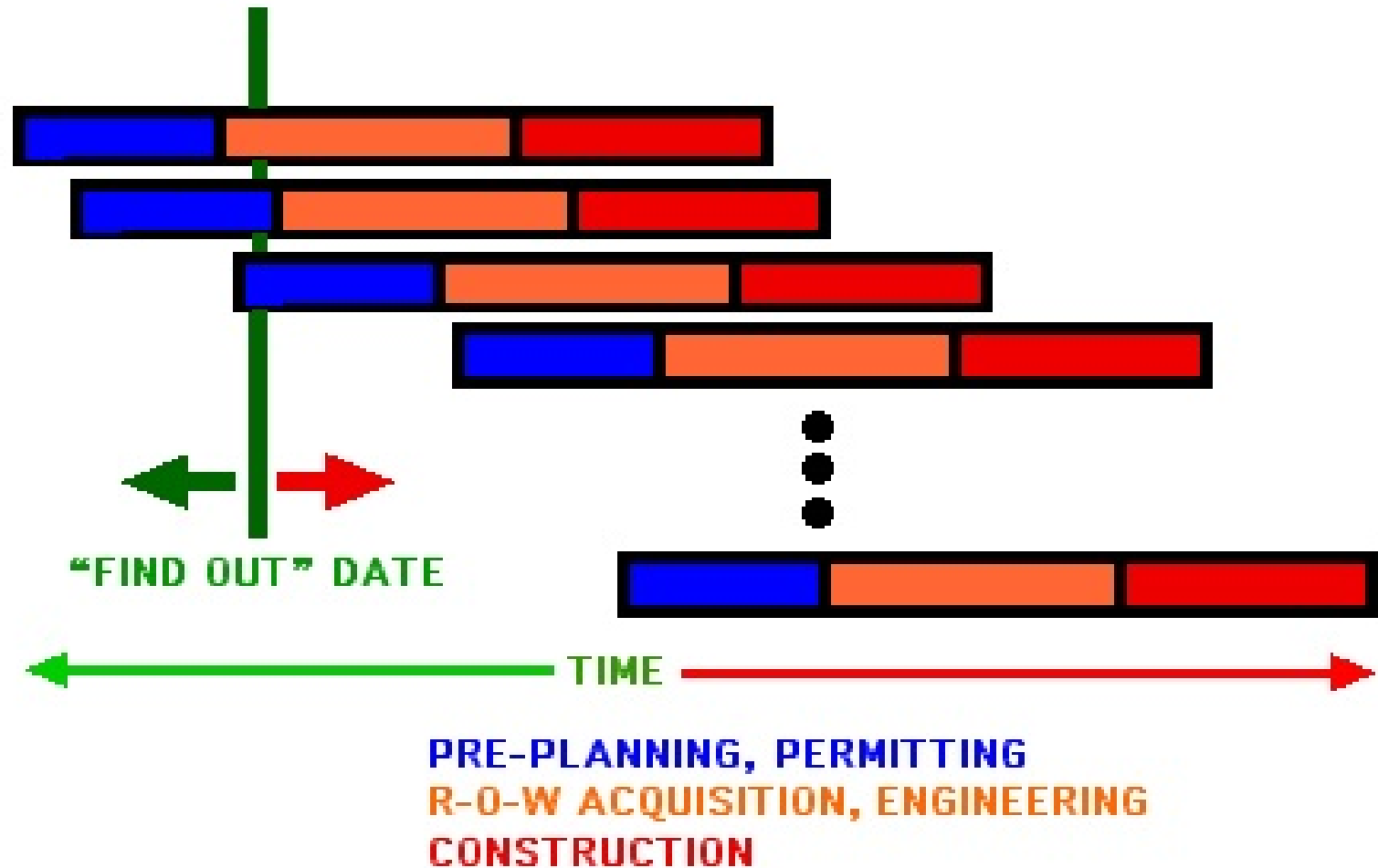
HYDROLLEY ADVANTAGES:

- **Avoids \$2.0 - 4.5 million capital investment per mile of track by eliminating track electrification.**
- **Avoids interference problems when tall equipment like cranes must be moved through cities.**
- **Eliminates the maintenance costs, shock hazards, weather, and security vulnerability of overhead power systems.**

HYDROLLEY POTENTIAL: MORE STREETCARS, AND SOONER:

- Substantially reduces fixed plant cost; “lowers the funding bar.”
- Clean, hi-tech *panache* will attract young and Green-minded ridership.
- If cities now planning streetcar systems **collaborate to plan**, R&D and manufacturing can proceed more rapidly; major scale pricing economies can be obtained.

THE COST OF NOT KNOWING



BEST TRANSITION STRATEGY: MAKE IT QUICK

Like Dave's brief trip through the vacuum of space, the least harm comes from **minimizing the duration** of the transition.

The duration can be minimized by early and thorough **sharing of heads-up hydroolley information**.

Making the transit industry aware quickly of the hydroolley option, and the expense and environmental problems it may avoid, *might* prevent large investments in overhead wire trolley projects *destined never to be completed*.

*But there is an important **caveat** :*

THE FREEZE-UP RISK

If aspiring new streetcar authorities are scared-off from overhead trolley construction **but** fear-of-the-untried stalls hydrolley buy-in, then the advantages of a rapid streetcar renaissance are lost.

Thus, it's in everyone's best interest to **bring a proof-of-concept hydrolley into existence** as soon, and as rapidly, as possible.

Due to Mooresville's desire to be home of the world's first hydrolley manufacturer, HEAT would like to see **Proterra LLC** selected as the builder and **Charlotte's CATS** be the demonstration site.



Jim Graebner - Chair, APTA Trolley subcommittee

presented with thanks from Mooresville and HEAT
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and to Jean-Paul Moskowitz of ALSTOM, Paris, France

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